Traffic Safety
Problem Identification

FY 2007

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State Highway Traffic Safety Office
Montana Department of Transportation
2701 Prospect Avenue
Helena, Montana 59620-1001
http://www.mdt.mt.gov/safety/safetyprg.shtml

Contents

A. INTRODUCTION

This document is used to identify and analyze trends and to evaluate problem areas related to highway traffic safety in Montana. The data within is used for the planning of the Highway Safety Program for the upcoming fiscal year. The analysis is intended to provide information to highway traffic safety specialists that will assist in the design of counter-measures for specific problem areas.

Much of the information contained within this publication originates from traffic crashes occurring upon public roadways. The trends and contributing factors of the resultant injuries and fatalities along with the demographics for the drivers and vehicles involved are presented. Rates are calculated using vehicle miles, licensed drivers or population when possible.

Data is first presented on crash numbers, general exposure and demographics. Included in this are population statistics, driver license information, vehicle registrations, vehicle miles traveled and breakdowns of driver demographics within crashes. Information is presented in the latter half of this document on potential problem areas and items of possible interest such as impaired driving; occupant protection; speed; hazardous actions; motorcycles and pedestrians. Many tables contain ten years of data. In these tables, current year data are compared to the previous year and the average of the previous five years. The last two lines of these tables usually contain the percentage change for these comparisons.

Some crashes such as single vehicle run off the road, wild animal crashes and very minor crashes are not reported to law enforcement. Most local law enforcement agencies are very good at submitting crash reports to the Montana Highway Patrol. Few crash reports are received from reservation law enforcement agencies because of their status as sovereign nations. The database does not contain every crash that meets the criteria, but should be very nearly complete for crashes involving minor and serious injuries.

The data elements within the crash record system include information on vehicles, roadway, drivers, passengers, pedestrians, bicyclists, and crash details. Some tables summarize crash counts, while others summarize the number of drivers, number of vehicles, number of occupants or number of injuries and these differences can be subtle and confusing. In addition, sections of tables may concern all crashes while other sections contain data for fatal crashes or other subsets. Special care must be taken by the reader to understand what exactly is being summarized within each table.

B. TRAFFIC CRASH AND EXPOSURE STATISTICS

Montana, along with most of the Rocky Mountain States, has unique problems in traffic safety. Unfortunately, Montana is often at the extreme even among these states. The Rocky Mountain States tend to be high on roadway departure fatalities. This may be the result of a higher percentage of high-speed traffic and longer trips on mostly rural roads. Very few of Montana's vehicle miles traveled occur in the urban environment. A high percentage of miles traveled are at high speeds compared to more urban states, thus increasing the likelihood of fatal crashes. Road departure crashes account for 30% of the crashes, but over 60% of the fatal crashes. Single vehicle fatal crashes account for 58% of the fatal crashes in the United States. In Montana over 71% are single vehicle fatal crashes. On the Montana Indian Reservations over 66% of the fatal crashes are single vehicle crashes.

American Indian fatalities as a percentage of all fatalities tend to be high for the Rocky Mountain States. These Indian fatalities have higher rates of alcohol involvement. Each year in Montana, 13 to 20 percent of traffic deaths are Indian fatalities. Over 22% of the alcohol related fatalities in Montana were American Indians during 2005, which was well below the 2004 number of 30%.

The makeup of the vehicle population is also different in the Rocky Mountain States. The percentage of registered pickups, SUV's and vans is very high in Montana as are fatal crashes involving these vehicle types. Montana has the highest percentage in the country at 44% resulting from fatalities in these types of vehicles, while the US average is 25%. Occupants of pickups wore seat belts at a rate 20% lower than occupants of passenger cars during a Montana seat belt survey conducted during April 2006.

All of these factors push fatality rates upward in Montana and the surrounding states. These factors, along with longer rural trips, are much of the reason that states in the Rocky Mountain region show high fatality rates. Meeting NHTSA's national goals will be more difficult for Montana than for states in other parts of the country.

On the positive side is the response of Montanan's to our secondary seat belt law. Montana has very high usage for a secondary law state. Unfortunately, the drivers who take the most risks are still not belting up. There is a minority hardcore group in Montana that tends to speed, drink, drive aggressively, while not buckling their belts. This is a killing combination.

During 2005, there were 22 more fatalities in Montana than during 2004. Injury crashes increased slightly but were still the second lowest number during the last ten years. Ten years of reportable crash and injury data appear in Table 1. Traffic crash and injury counts generally increased during the first seven years of the 1990's, then leveled. Crash counts during 2005 were higher than 2004.

Table 1
Crashes by Severity

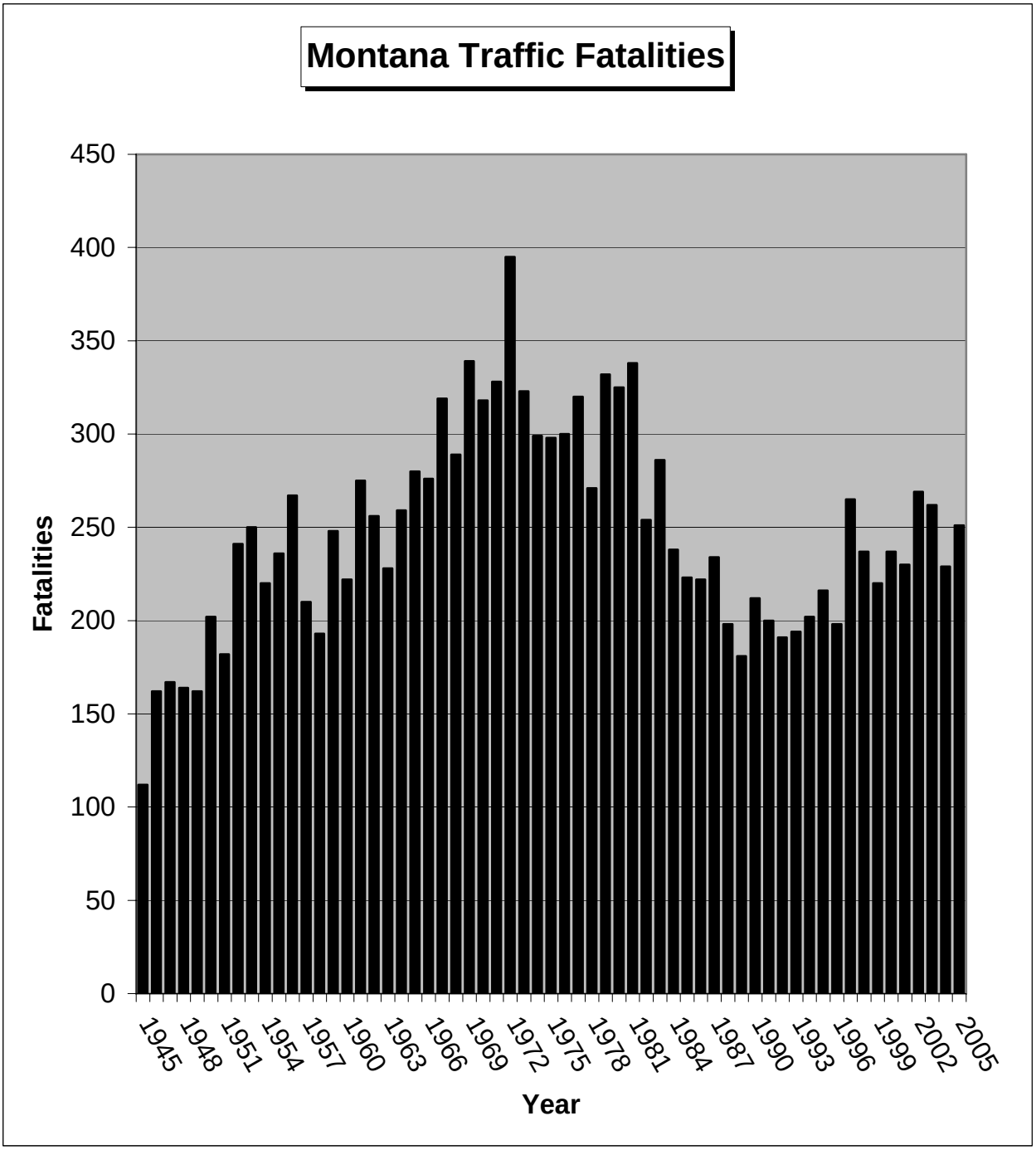
Year	All Crashes	Fatal Crashes	Injury Crashes	Property Damage Crashes	Fatalities	Injuries
1996	24,882	177	6,980	17,665	198	10,557
1997	22,619	223	6,951	15,445	265	10,688
1998	22,068	208	6,728	15,132	237	10,075
1999	21,078	194	6,769	14,113	220	10,459
2000	22,254	203	7,053	15,000	237	10,798
2001	21,846	201	6,220	15,420	230	8,982
2002	23,527	232	6,479	16,816	269	10,086
2003	23,160	239	6,229	16,681	262	9,632
2004	21,783	209	6,000	15,570	229	9,263
2005	22,376	224	6,066	16,086	251	9,211
Chg 1 Yr	+2.7%	+7.2%	+1.1%	+3.3%	+9.6%	-0.6%
Chg 5 Yr	-0.6%	+3.3%	-5.2%	+1.2%	+2.3%	-5.5%

Source: Traffic Information System (TIS) – Montana Department of Transportation

Injury crashes and especially severe injury crash counts tend to be more accurate indicators of safety trends in Montana than do crashes and fatalities. These crashes can represent change without as much of the variation caused by the small number associated with fatalities. Total Crashes tend to have variation that is strongly associated with the amount of icy roads. Severe injury crashes are defined as those crashes involving a fatality or an incapacitating injury. This information will be shown later in Table 4.

A Montana history of fatality numbers on public roadways is presented in the graph on the following page. Fatalities reached an all time high of 395 during 1972. The lowest number of fatalities since 1950 was 181, which occurred during 1989, the second year of Montana's seat belt law. The number of fatalities in 2005 was the fourth time that fatalities surpassed 250 during the last 22 years. This has occurred three times in the last four years.

Figure 1


Montana Traffic Fatalities
Fatalities
450
400
350
300
250
200
150
100
50
0
1945
1948
1951
1954
1957
1960
1963
1966
1969
1972
1975
1978
1981
1984
1987
1990
1993
1996
1999
2002
2005
Year

There are several exposure statistics in the area of traffic safety. These include number and type of vehicles, number of licensed drivers by age and gender, physical road miles, population, and the number of vehicle miles driven. Table 2 displays Vehicle Miles Traveled (VMT), which is the estimated number of total miles driven by all vehicles on Montana public roads. This table also includes licensed drivers and registered motor vehicles. VMT is the exposure number that appears to have the greatest influence on the amount of traffic crashes that occur in Montana.

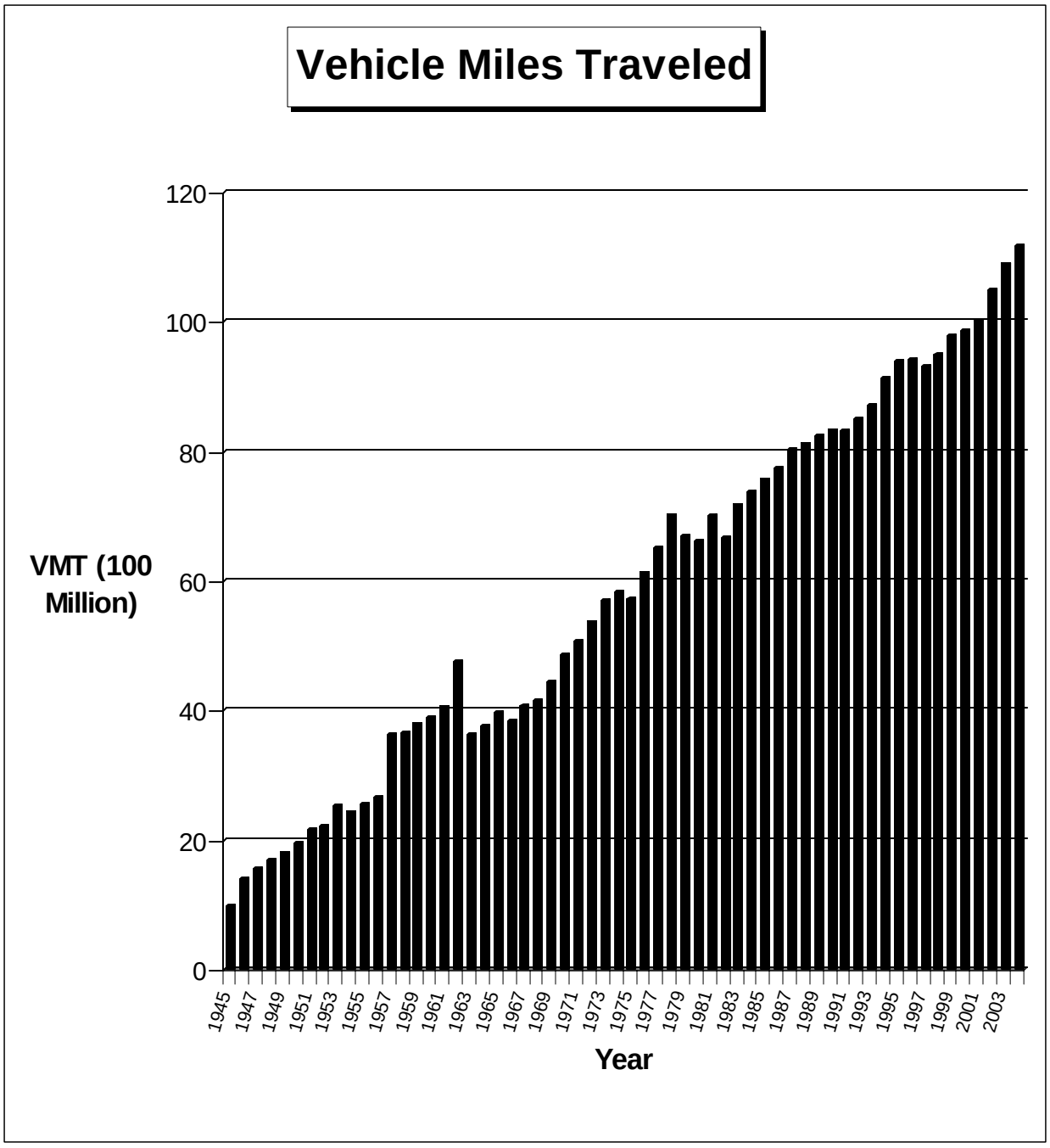
Table 2
Crash Exposure By Factors

Year	VMT (100 Million Miles)	Licensed Drivers	Registered Motor Vehicles (plus trailers)
1996	94.2	NA	1,010,506
1997	93.2	NA	1,028,570
1998	94.9	646,512	1,042,183
1999	97.8	NA	NA
2000	98.6	678,899	1,009,930
2001	100.1	683,351	1,135,491
2002	104.9	694,743	1,165,808
2003	109.0	704,509	1,207,314
2004	111.8	712,880	1,248,215
2005	112.0 (est)	715,512	1,356,165
Chg 1 Year	+0.2%	+0.4%	+8.6%
Chg 5 Year	+6.8%	+3.0%	+17.6%

Source: VMT – Montana Department of Transportation (2005 estimate is a Highway Safety Office estimate)
Drivers Licenses and Registered Vehicles – Department of Justice

The annual vehicle miles traveled are shown on the following chart. These numbers increase almost every year. During 1972, the vehicle miles traveled (VMT) for Montana was 5.4 billion and 395 fatalities occurred. Now in 2005, this figure has more than doubled at 11.2 billion miles traveled with 251 fatalities. Even when crash numbers, injuries and fatalities are held stable, gains in rates are made because of increases in exposure. A chart of the history of VMT is shown on the following page.

Figure 2


Vehicle Miles Traveled
VMT (100 Million)
120
100
80
60
40
20
0
1945
1947
1949
1951
1953
1955
1957
1959
1961
1963
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
Year

The fatality rate for Montana was 7.64 fatalities per hundred million miles traveled during 1969. This rate has been generally decreasing since then. It had decreased to 4.92 in 1980. For the year 2005, the estimated fatality rate was 2.24 which is up from the record low during 2004.

The injury rate was 82.4 (estimate) for the year 2005. This was the lowest rate ever in Montana. The crash rate was 200.1 (estimate), which was above the rate for 2004 but still lower than any other year except 1987.

Table 3
Statewide Crash Rates
(Per Vehicle Miles Traveled)

Year	Fatality Rate (per 100Million VMT)	Injury Rate (per 1Million VMT)	Crash Rate (per 1Million VMT)
1996	2.10	1.12	2.64
1997	2.84	1.15	2.43
1998	2.50	1.06	2.33
1999	2.25	1.07	2.15
2000	2.40	1.04	2.26
2001	2.30	0.90	2.18
2002	2.57	0.96	2.24
2003	2.40	0.88	2.13
2004	2.04	0.83	1.95
2005	2.24 (est.)	0.82 (est.)	2.00 (est.)
Chg 1 Year	+9.8%	-1.2%	+2.6%
Chg 5 Year	-4.4%	-11.1%	-7.1%

Source: TIS and Traffic Data Collection - Montana Department of Transportation

Historically, western rural states have tended to have rates above the national average. One of the reasons is the greater percentage of rural miles traveled which translates to higher average speeds. During 2001, the United States rural fatality rate was 2.3 while the urban fatality rate was 1.0. For the nation, rural fatalities accounted for 61% of the traffic fatalities, while in Montana 85 - 90% of the fatalities are a result of rural fatal crashes. From this information, it stands to reason that the expected Montana rate would be much closer to 2.3 than the national rate of 1.5. Figure 3 compares the national fatality rate with the Montana rate.

Figure 3

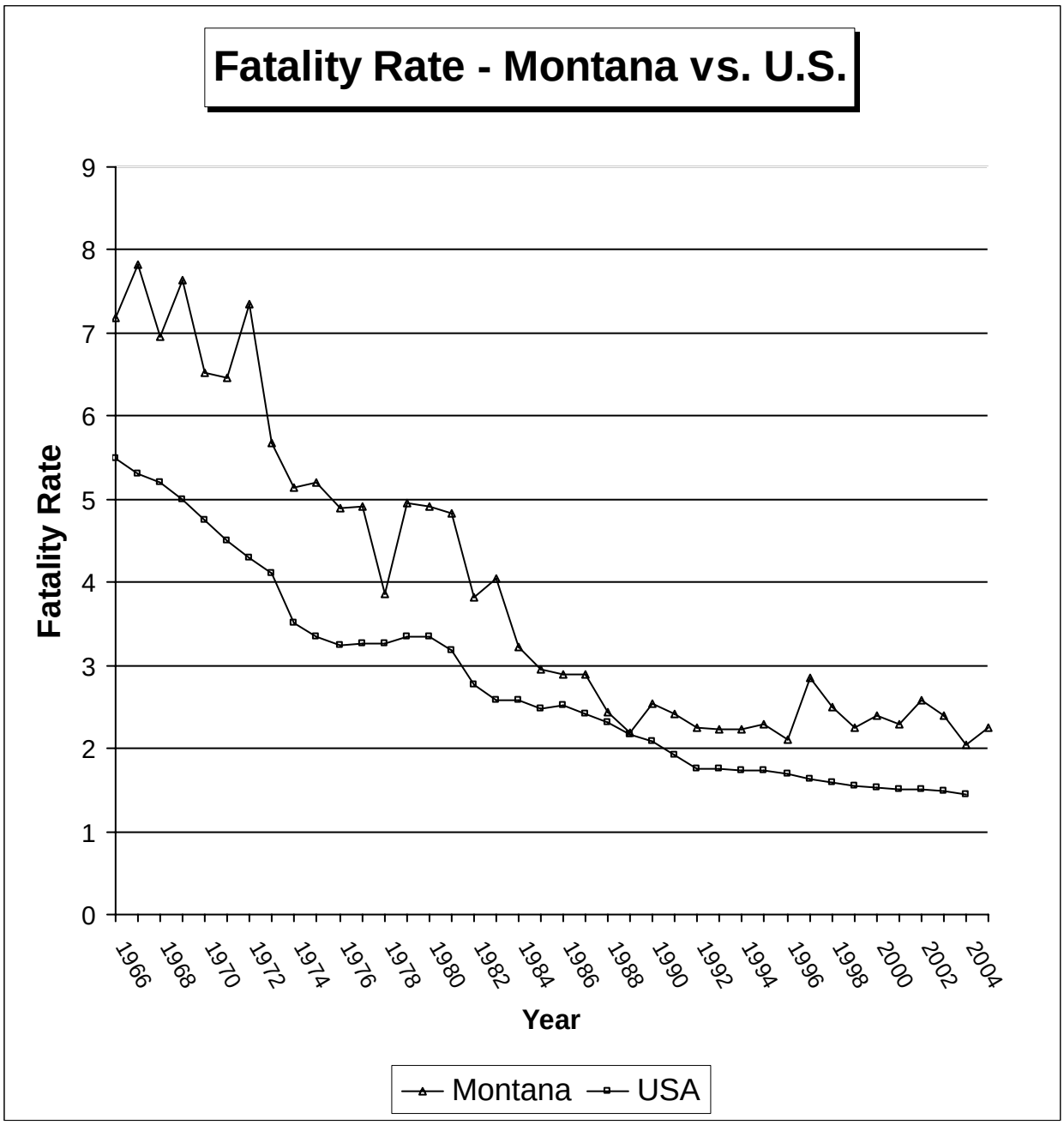

Fatality Rate - Montana vs. U.S.
Fatality Rate
0
1
2
3
4
5
6
7
8
9
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
Year
Montana
USA

Table 4 displays the distribution of injury severity to persons involved in motor vehicle crashes for the last ten years. Injury severity may aid in determining whether restraint use and airbags are saving lives and reducing the level of injury severity. Also displayed are Severe Injuries (Fatalities + Incapacitating), which may be the best true overall indicator for traffic crash trends.

Table 4
Injury Severity
(persons)

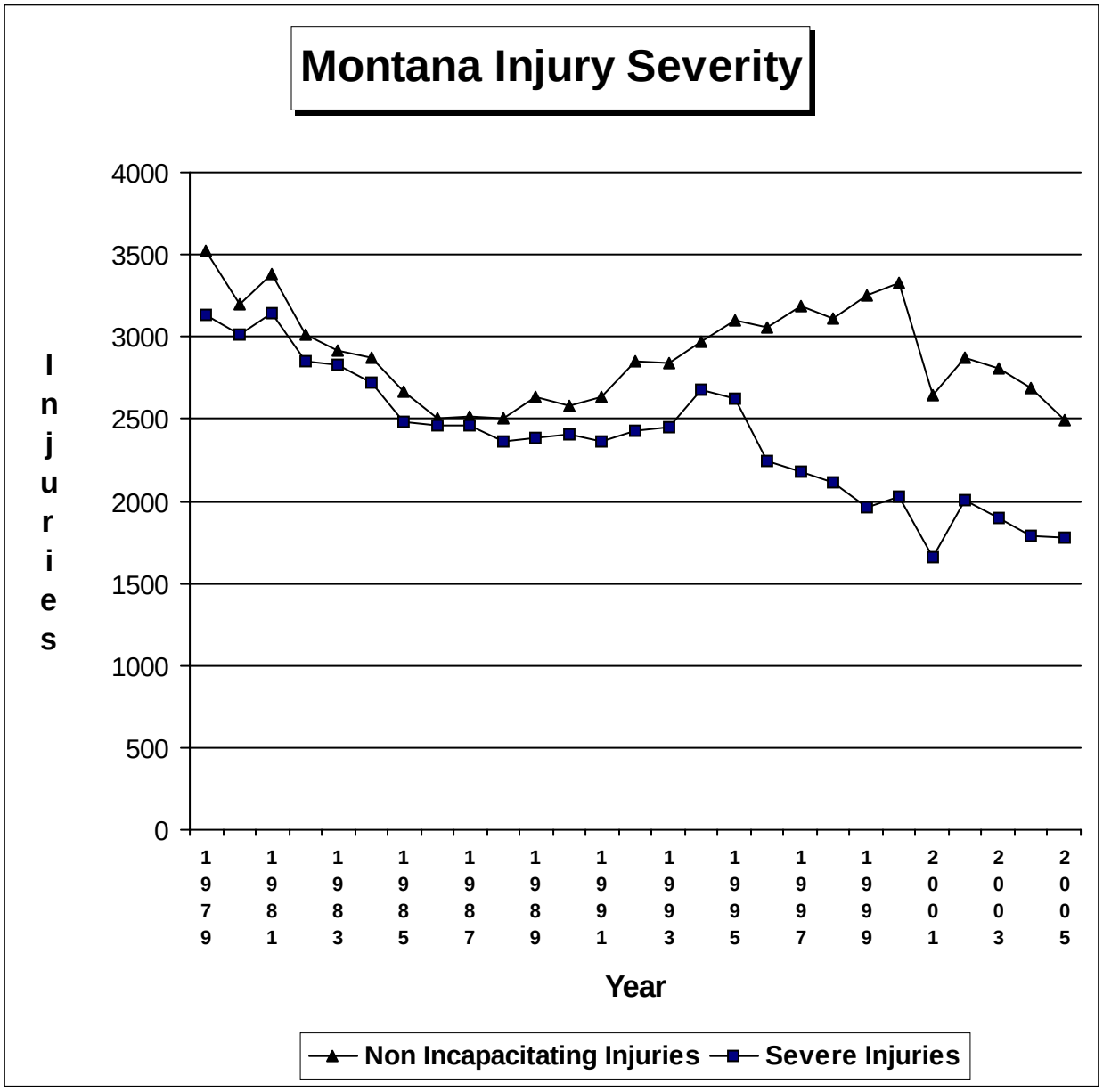
Year	Fatalities	Incapacitating Injury	Non Incapacitating Injury	Possible & Other Injury	Severe Injuries (Fatalities plus Incapacitating)
1996	198	2,043	3,057	5,457	2,241
1997	265	1,917	3,187	5,584	2,182
1998	237	1,834	3,044	5,202	2,071
1999	220	1,739	3,254	5,466	1,959
2000	237	1,790	3,325	5,683	2,027
2001	230	1,433	2,645	4,904	1,663
2002	269	1,738	2,876	5,472	2,007
2003	262	1,634	2,812	5,186	1,896
2004	229	1,557	2,692	5,013	1,796
2005	251	1,541	2,509	5,161	1,792
Chg 1 Yr	+9.6%	-1.0%	-6.8%	+3.0%	-0.2%
Chg 5 Yr	+2.3%	-5.5%	-12.6%	-1.7%	-4.6%

Source: TIS - Montana Department of Transportation

Severe injuries (fatalities plus incapacitating injuries) have decreased over 31 percent since 1995. The 2005 value was the second lowest during the last 50 years. The change downward in the number of severe injuries would appear to be the most significant change in data within Montana during the last few years.

It would seem that occupant restraints, airbags and child restraints have accounted for at least part of this decrease. The change in severity is also the result of more forgiving roadways and improved emergency medical services and quicker response times due to cell phones. Figure 4 on the following page shows clearly this history of injuries over time.

Figure 4


Montana Injury Severity
Injuries
4000
3500
3000
2500
2000
1500
1000
500
0
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
Year
Non Incapacitating Injuries
Severe Injuries

The following table examines rural fatal crashes in Montana. Fatal crashes occur mostly on rural roads within the state, because of the speed involved. Thirty-three fatalities occurred on urban roads during 2005 from thirty different crashes. The other 218 fatalities occurred on rural roads from 194 crashes. Similarly there were 281 incapacitating injuries on urban roads while 1,260 serious injuries occurred in the rural setting.

Table 5
Rural Fatal Crashes

Year	Fatal Crashes	Rural Fatal Crashes	Percent Rural
1996	177	158	89.3%
1997	223	208	93.3%
1998	208	180	86.5%
1999	194	176	90.7%
2000	203	185	91.1%
2001	201	187	93.0%
2002	232	209	90.1%
2003	239	214	89.5%
2004	209	184	88.0%
2005	224	194	86.6%
Chg 1 Year	+7.2%	+5.4%	-1.6%
Chg 5 Year	+3.3%	-0.9%	-4.1%

Source: TIS - Montana Department of Transportation

Rural crashes averaged 1.29 vehicles per crash, while urban crashes averaged 1.96 vehicles. Crash configurations are much different. Most rural crashes (73.0%) involve just one vehicle, while most urban crashes (81.0%) involve two vehicles. Tables 7 and 8 on the following page tabulate rural and urban crashes by the number of vehicles involved. A large number of run off the road single vehicle crashes occur on the rural roads of Montana. City crashes tend to be collisions of multiple vehicles at or near intersections. These events tend to be multiple vehicles crashing at an angle or one vehicle striking the rear of another vehicle.

Table 6

Number of Involved Vehicles --- Rural vs. Urban Crashes – 2005

Vehicles	Rural		Urban		Total	
	Crashes	Percent	Crashes	Percent	Crashes	Percent
1	7,984	73.0%	1,346	11.8%	9,330	41.7%
2	2,775	25.4%	9,245	81.0%	12,020	53.8%
3	145	1.3%	728	6.4%	873	3.9%
4	26	0.2%	82	0.7%	108	0.5%
>=5	4	0.0%	14	0.1%	18	0.1%
Total	10,934	100.0%	11,415	100.0%	22,349	100.0%

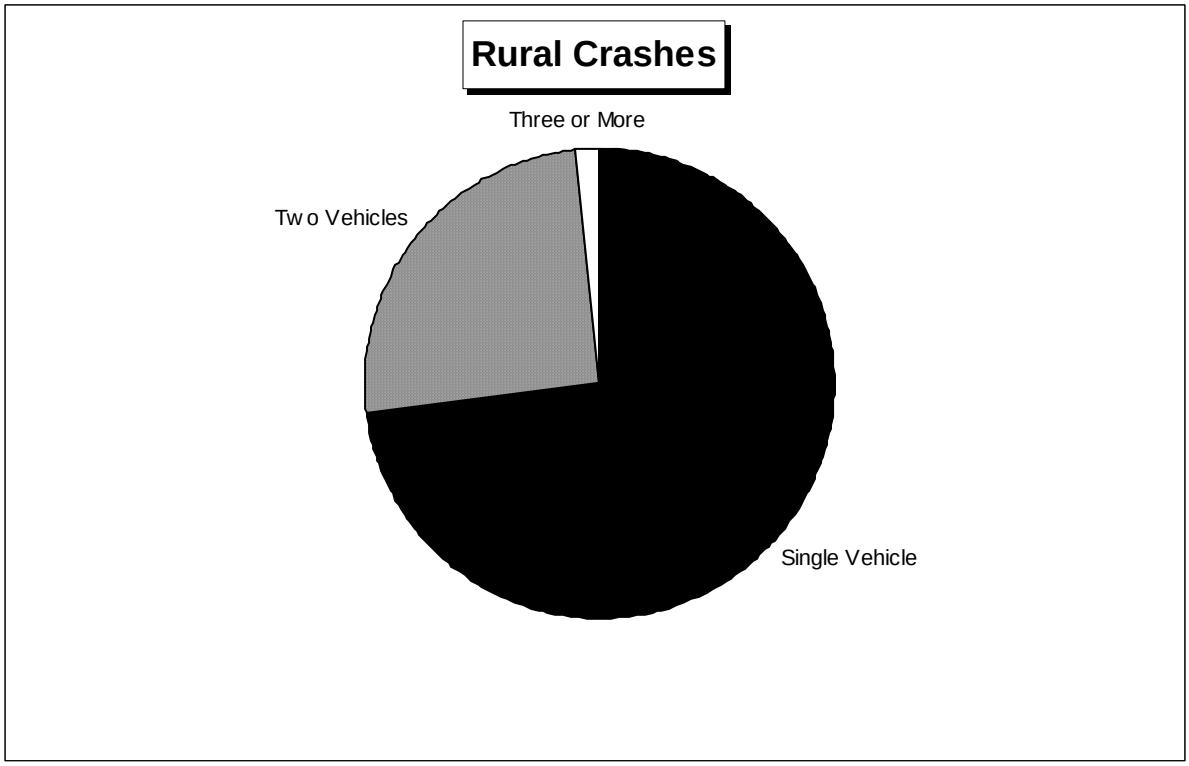
Table 7

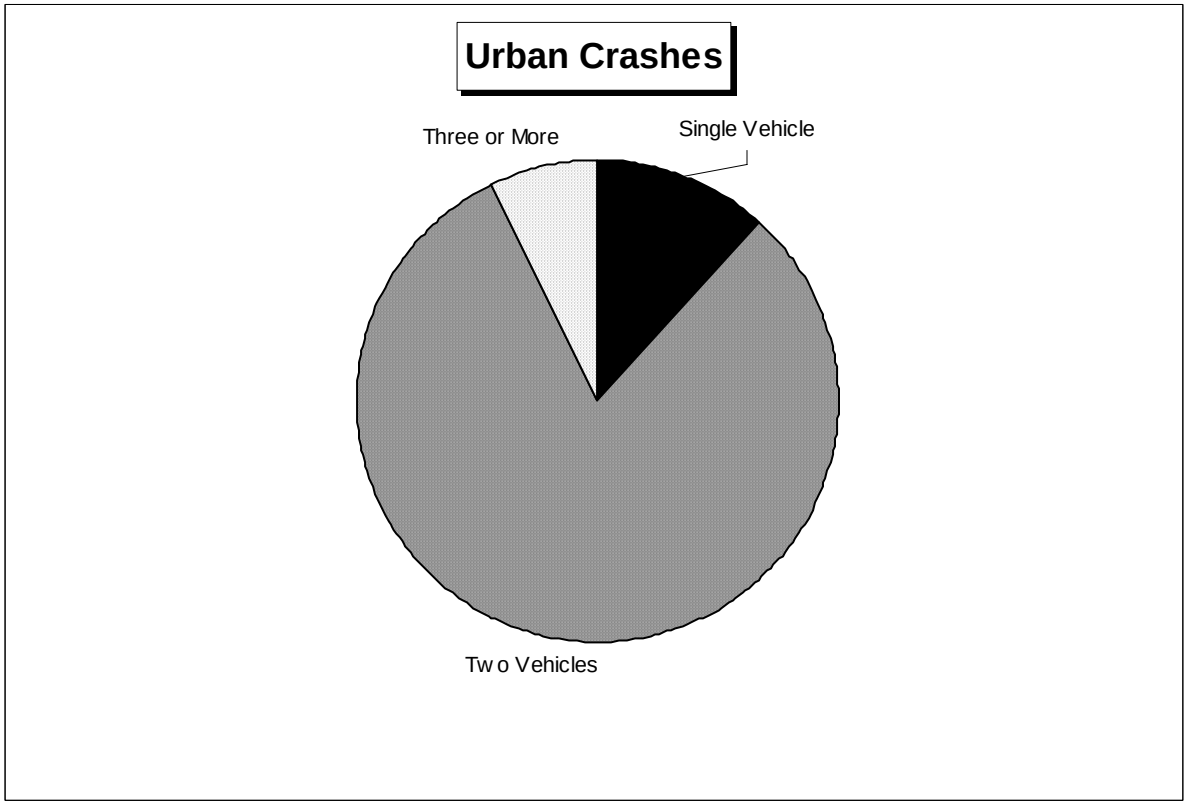
Number of Involved Vehicles --- Rural vs. Urban Fatal Crashes – 2005

Vehicles	Rural		Urban		Total	
	Fatal Crashes	Percent	Fatal Crashes	Percent	Fatal Crashes	Percent
1	142	73.3%	16	53.3%	158	70.6%
2	47	24.2%	13	43.3%	60	26.8%
3	3	1.5%	1	3.3%	4	1.8%
4	1	0.5%	0	0.0%	1	0.4%
>=5	1	0.5%	0	0.0%	1	0.4%
Total	194	100.0%	30	100.0%	224	100.0%

Figure 5 on the following page shows the number of vehicles by percentage in both rural and urban situations.

Figure 5


Rural Crashes
Three or More
Two Vehicles
Single Vehicle


Urban Crashes
Three or More
Single Vehicle
Two Vehicles

When examining type of collision for multiple-vehicle crashes in rural incidents, rear end collisions were most numerous. Right angle crashes and sideswipe crashes were next. These collision-types accounted for over 79% of the total. For Urban areas, right angle crashes were the most common collision type, followed by rear end crashes and other collision types. Rear end and right angles crashes accounted for over 66% of these urban crashes.

Table 8
Type Of Collision --- Rural vs. Urban Crashes - 2005
(Two or More Vehicles)

Type of Collision	Rural		Urban	
	Crashes	Percent	Crashes	Percent
Rear End	990	33.5%	3,204	31.8%
Sideswipe – Same Direction	387	13.1%	735	7.3%
Sideswipe – Opposite Direction	274	9.3%	176	1.7%
Left Turn – Same Direction	43	1.5%	125	1.2%
Left Turn – Opposite Direction	91	3.1%	369	3.7%
Right Angle	687	23.3%	3,509	34.9%
Right Turn – Same Direction	9	0.3%	78	0.8%
Right Turn – Opposite Direction	5	0.2%	32	0.3%
Head On	169	5.7%	87	0.9%
Other	295	10.0%	1,754	17.4%
Total	2,950	100.0%	10,069	100.0%

Economic loss from motor vehicle crashes is shown for recent years in Table 9. These losses are calculated using national estimates for average property damage only crash cost, injury cost by injury level and fatality cost, which are provided by the National Safety Council. These estimates cover wage loss, medical expense, insurance administration and property damage costs. Indirect costs for human suffering and loss are more intangible and are not included as part of this estimate.

Table 9
Economic Loss in Crashes
(Millions of Dollars)

Year	Economic Loss
1996	$432
1997	$532
1998	$498
1999	$481
2000	$525
2001	$500
2002	$605
2003	$623
2004	$572
2005	$595
Change 1 Year	+4.0%
Change 5 Year	+5.3%

Source: Montana Department of Transportation

Economic loss due to traffic crashes increased slightly in 2005. Last year the economic loss for Montana crashes was just under 6/10's of a billion dollars. That is an average of over $640 for every citizen in Montana. Over 158 million dollars of loss were the result of alcohol related crashes.

C. CRASH DEMOGRAPHICS

1. Gender of Drivers

Male drivers are more likely to be involved in crashes than female drivers, when prorated by the number of licensed drivers. However, when based upon average national vehicle miles driven by gender, this difference in crash rates largely disappears. No state statistics on miles traveled by gender are available.

Driver involvement in crashes by gender is shown in Table 10. While male involvement is 58.6% of all crashes, involvement by females has been increasing consistently over the past 20 years as vehicle miles driven increases for female drivers.

Table 10
Driver's Gender in Crashes

Year	Gender of Drivers			Percent of Total	
	Female	Male	Total	Female	Male
1996	14,932	23,326	38,258	39.0%	61.0%
1997	13,943	20,915	34,858	40.0%	60.0%
1998	12,818	19,382	32,200	39.8%	60.2%
1999	12,248	18,904	31,152	39.3%	60.7%
2000	13,237	20,008	33,245	39.8%	60.2%
2001	13,189	19,036	32,225	40.9%	59.1%
2002	14,623	21,082	35,705	41.0%	59.0%
2003	14,330	20,650	34,980	41.0%	59.0%
2004	13,578	19,428	33,006	41.1%	58.9%
2005	13,943	19,720	33,663	41.4%	58.6%
Chg 1 Year	+2.7%	+1.5%	+2.0%	+0.7%	-0.5%
Chg 5 Year	+1.1%	-1.6%	-0.5%	+1.6%	-1.1%

Men have a disproportionate involvement in **fatal** crashes. Past studies have shown that men have higher involvement in overturns, other non-collision crashes, crashes into fixed objects and the striking of animals. Much of this is due to men's much higher

involvement in alcohol-related crashes. Table 11 follows with information on the gender of drivers in fatal crashes.

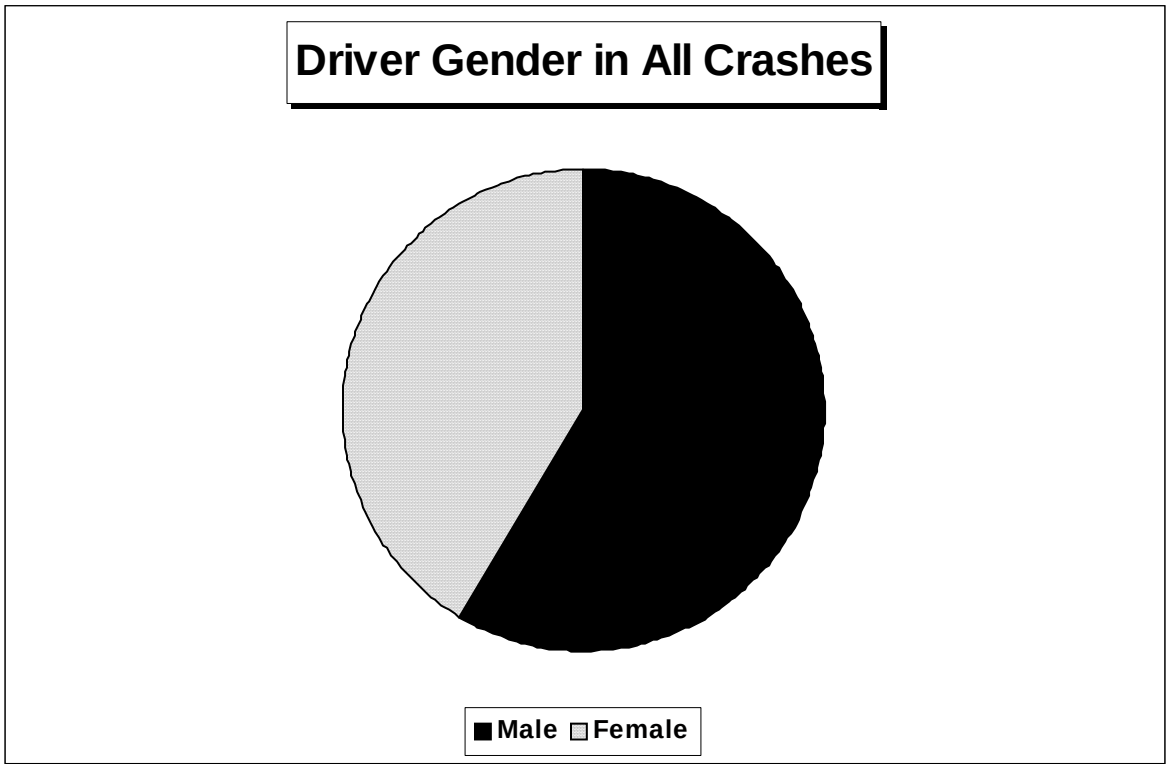
Table 11
Driver's Gender in Fatal Crashes

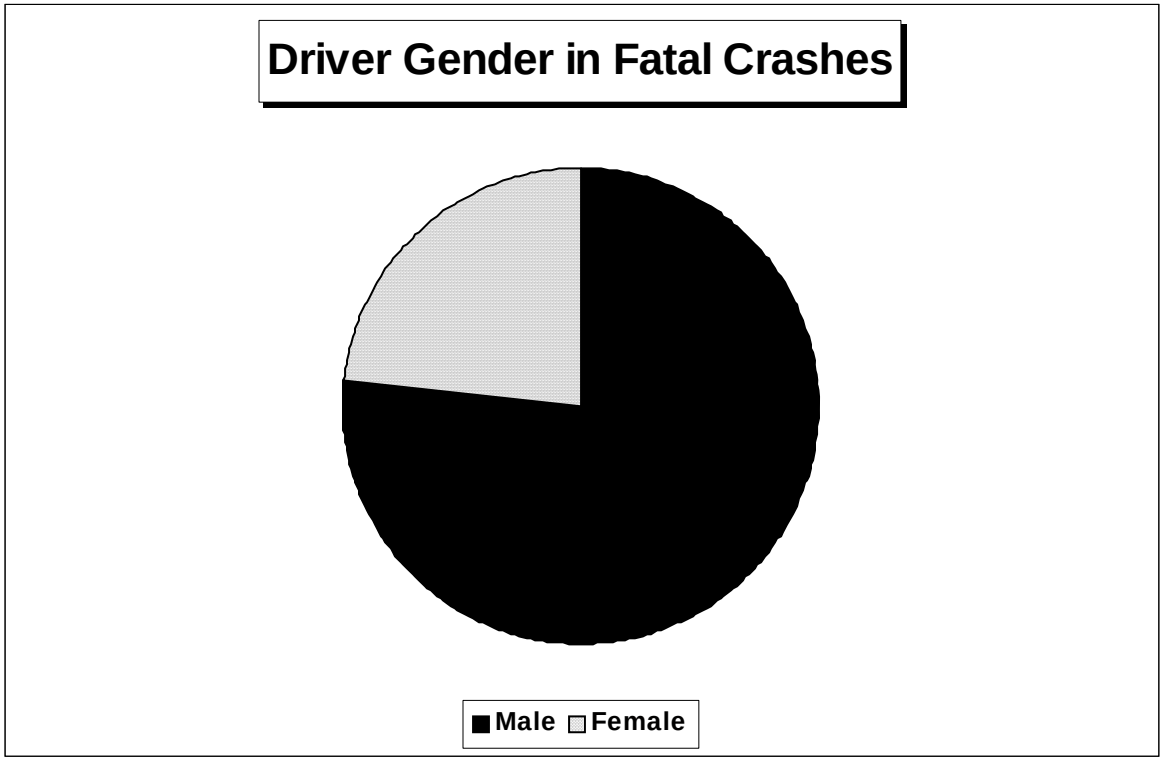
Year	Gender of Drivers			Percent of Total	
	Female	Male	Total	Female	Male
1996	71	177	248	28.6%	71.4%
1997	74	218	292	25.3%	74.7%
1998	68	213	281	24.2%	75.8%
1999	78	187	265	29.4%	70.6%
2000	77	225	302	25.5%	74.5%
2001	63	213	276	22.8%	77.2%
2002	71	248	319	22.3%	77.7%
2003	96	236	332	28.9%	71.1%
2004	86	198	284	30.3%	69.7%
2005	70	231	301	23.3%	76.7%
Chg 1 Year	-18.6%	+16.7%	+6.0%	-23.1%	+10.0%
Chg 5 Year	-10.9%	+3.1%	-0.5%	-9.3%	+3.6%

Source: TIS – Montana Department of Transportation

With the relatively small number of fatal crashes in Montana, the above percentages vary from year to year. It appears that during this ten-year period approximately 75% of the drivers in these crashes are male. Figure 6 on the following page displays the ratio of drivers by gender involved in all crashes and fatal crashes during 2005.

Figure 6


Driver Gender in All Crashes
Male
Female


Driver Gender in Fatal Crashes
Male
Female

2. Gender and Age of Injuries

Injury involvement by gender is shown below in Table 12. During 1997, females for the first time in Montana sustained more injuries than males resulting from traffic crashes. This occurred again in 2001. There has been a slow and steady increase in vehicle miles traveled for women nationally over the past few decades. This would explain the general increase in injury percentage. It is interesting that women are sustaining nearly as many injuries as men, since they tend to wear restraints more than men and they, at least nationally, travel less vehicle miles. Men still account for about 65 to 75% of the fatalities.

Table 12
Injuries by Gender – 2005

Age Group	Fatalities	Injuries
Male	189	4,744
Female	62	4,454

Source: TIS – Montana Department of Transportation

Table 13 shows injury numbers by age group for 2005. It should be noted that the 15-19 injury numbers are still very high.

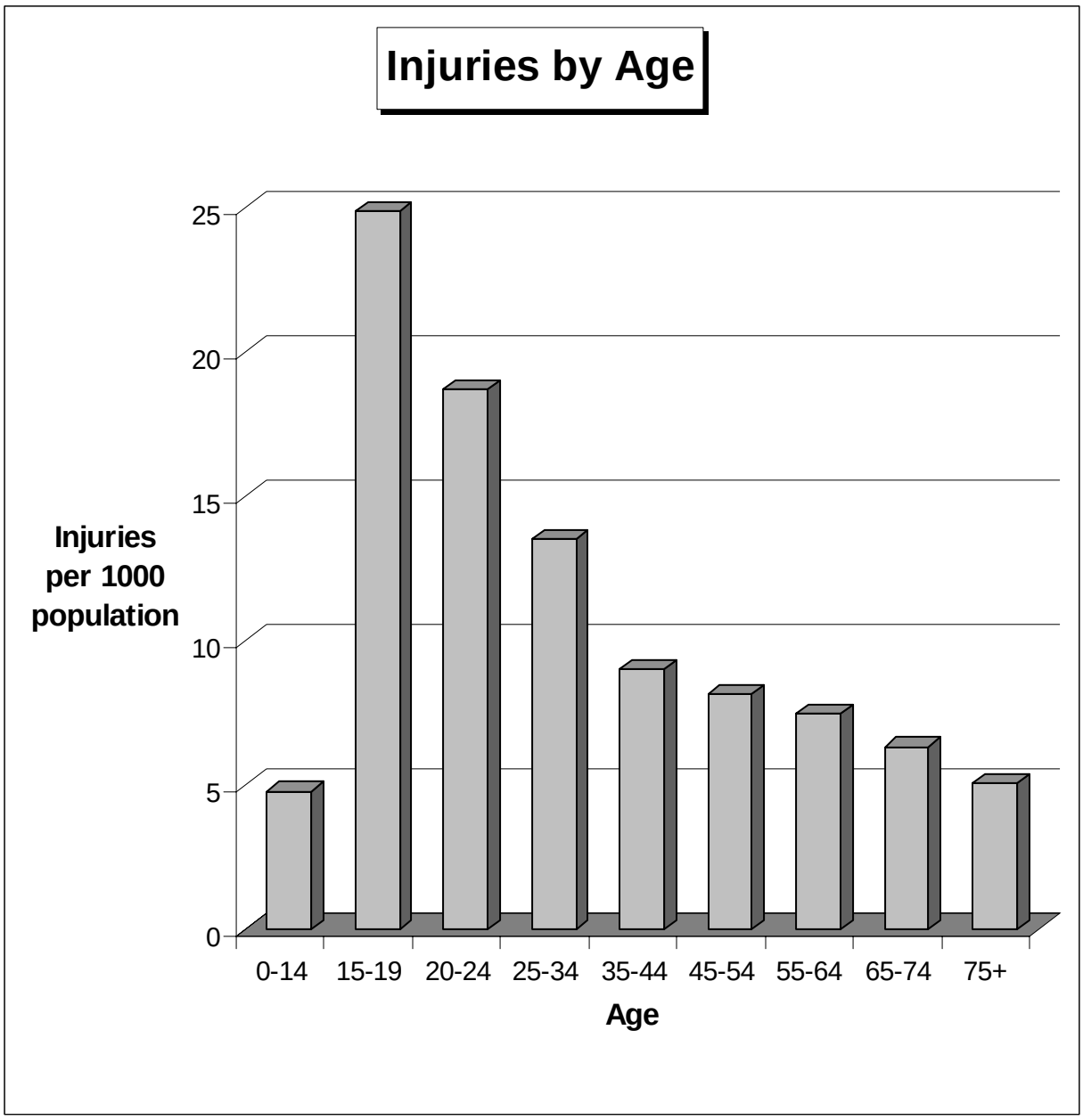
Table 13
Injuries by Age – 2005

Age Group	Fatalities	Injuries
0-4	5	225
5-9	1	239
10-14	5	337
15-19	22	1,745
20-24	31	1,301
25-34	52	1,444
35-44	32	1,151
45-54	31	1,238
55-64	34	794
65-74	18	418
75+	20	306

Source: TIS – Montana Department of Transportation

Figure 7 on the following page shows the rate of injuries per 1000 population by age. From this chart, it is quite evident from that greater danger exists for teens and young adults.

Figure 7


Injuries by Age
Injuries per 1000 population
25
20
15
10
5
0
0-14
15-19
20-24
25-34
35-44
45-54
55-64
65-74
75+
Age

3. Race

The population of Montana has little racial diversity. The 2000 census showed the following breakdown of population.

Table 14
Montanans by Race

Race	White	American Indian	Two or More Races	Other	Asian	Blacks	Hawaiian and Pacific Isl
Percent	90.6%	6.2%	1.7%	0.6%	0.5%	0.3%	0.1%

The two predominant races account for 96.8 percent of the population and are the only two that contain enough data to analyze. Fatality data from the Fatality Analysis Reporting System (FARS) is the only available crash information by race.

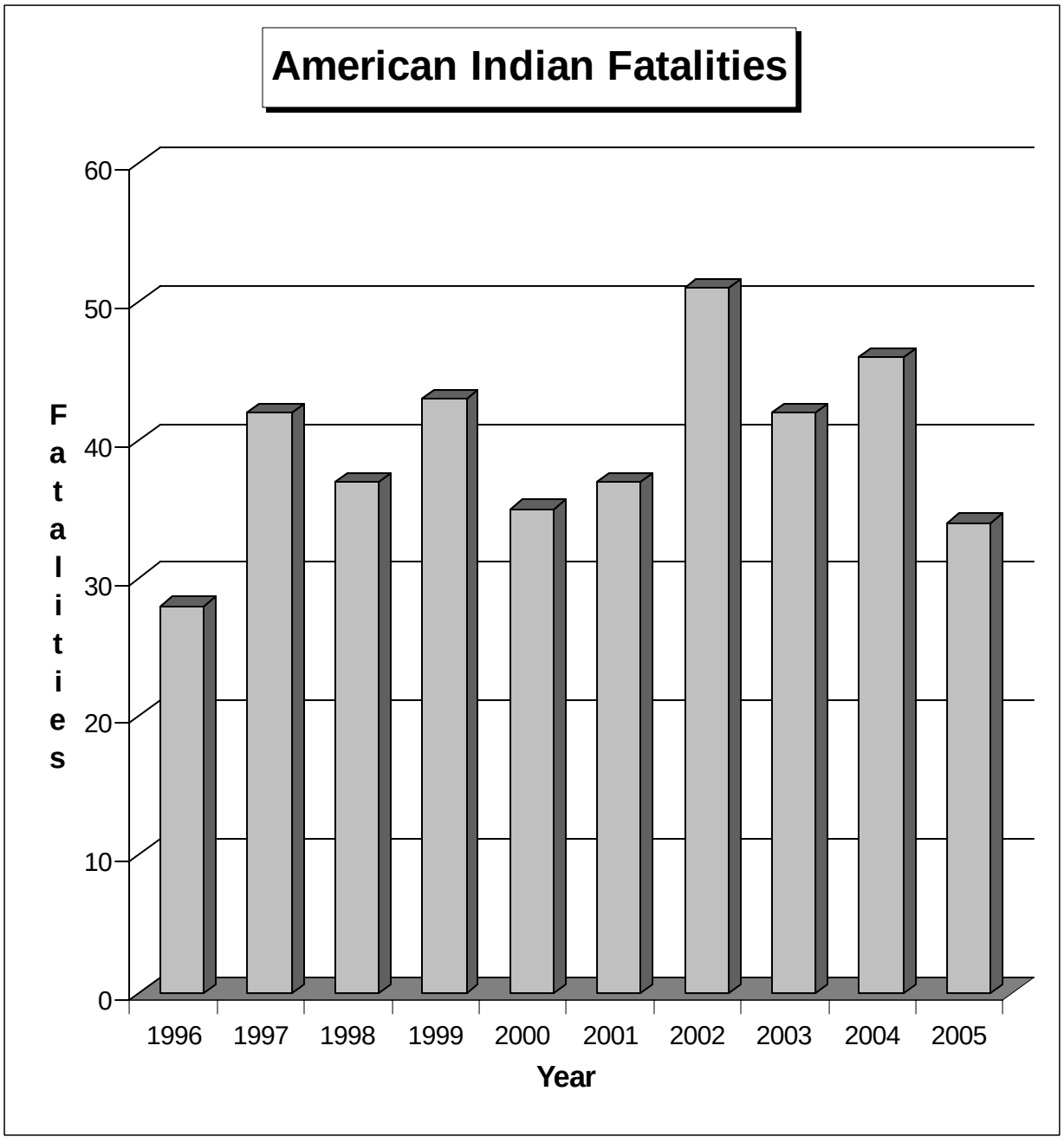
Table 15
American Indian Fatalities

Year	American Indian Fatalities	Total Fatalities	Percent of all Montana Fatalities	Indian Alcohol Related Fatalities	Percent of all Indian Fatalities	Percent of Montana Alcohol Related Fatalities
1996	28	198	14.0%	19	67.9%	24.4%
1997	42	265	15.8%	30	71.4%	24.2%
1998	37	237	15.6%	21	56.8%	20.0%
1999	43	220	19.5%	26	60.5%	23.9%
2000	35	237	14.8%	28	80.0%	23.9%
2001	37	230	16.1%	26	70.2%	25.0%
2002	51	269	18.9%	35	68.6%	27.8%
2003	42	262	16.0%	35	83.3%	27.3%
2004	46	229	20.1%	33	71.7%	31.1%
2005	34	251	13.5%	27	79.4%	22.5%

Source: FARS Database - MDT

Indian fatalities during each of the last ten years account for 13.5 to 20.1% of the total Montana fatalities, which is two to three times the percentage of population. Alcohol related American Indian fatalities accounted for 22.5% of the total alcohol related fatalities during 2005. During the past four years seat belt usage for Indian occupant fatalities has been less than 7%. Seat belt usage for other race occupant fatalities has been just over 30%. Figure 8 displays Indian fatalities over the last few years.

Figure 8


American Indian Fatalities
60
50
40
30
20
10
0
Fatalities
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year

4. Vehicle Type

National Data

There are major differences in severity of crashes depending on vehicle type. The rate of fatalities per 100,000 registered vehicles varies greatly. Nationally, during 2004, this rate for single vehicle fatal crashes per 100,000 vehicles is shown in Table 16.

A large portion of this difference is due to the chance of a rollover. NHTSA conducted a crash analysis of fatal crashes for different vehicle types during 2004.

Table 16
Vehicle Characteristics

Type of Vehicle	Fatality Rate in Rollovers (per 100,000 vehicles)	Fatality Rate in all Crashes (per 100,000 vehicles)
SUV's	9.29	15.07
Pickups	6.72	15.05
Passenger Cars	3.25	14.32
Minivans	3.45	11.09
Vans	4.04	9.34

Source: NHTSA

SUV's and pickups have a much higher propensity to rollover. The tendency in single vehicle crashes is for a driver to overcorrect when they first realize that they are in trouble. This overcorrection often leads to a rollover.

Over 44 percent of unrestrained fatal occupants are ejected from all types of vehicles as compared to only 6 percent of restrained fatal occupants according to 2003 National data. The risk of a fatal injury is many times higher if ejected than if not ejected. Fatally injured unrestrained occupants were ejected from the different types of vehicles as shown in Table 17.

Table 17
Ejection Rates for Unrestrained Fatal Occupants

Type of Vehicle	Ejection Rates
Passenger Cars	35%
SUV's	65%
Pickups	49%
Minivan	49%
Other Vans	49%

Source: NHTSA

Montana Data

As noted above, pickups and SUV's have a high susceptibility to rollover. Montana seat belt usage is much lower in pickups, which compounds the problem of rollovers. The following usage rates by vehicle type were obtained from a survey conducted during April 2006.

Table 18
Seat Belt Usage by Vehicle Type - 2006

Type of Vehicle	Usage Rate
Passenger Cars	81.0%
SUV's	81.2%
Pickups	62.9%
Vans *	60.0%

Source: State Highway Traffic Safety Office
* sample size of is statistically small (209)

There may be a perception by the public that most fatalities occur in multi-vehicle crashes involving head on and angle crashes. Many occupants of large vehicles perceive that they are safer and then decide not to wear their seat belt. In reality, 71% of fatal crashes in Montana are single vehicle crashes and 60% are road departure crashes. Single vehicle fatal crashes usually involve a rollover. It would appear that Montanan's must be educated about the rollover tendencies of vehicles and the importance of wearing belts in vehicles because of this risk of rollover and ejection.

There are many reasons why Montana has the one of the highest fatality rates in the nation in addition to a high incidence of impaired driving.

- A high percentage of driving is rural so that a high percentage of the vehicle miles traveled are at high speeds.
- A high percentage of registered vehicles in the state are pickups and these vehicles have higher fatality rates.
- Restraint use is significantly lower in pickups.
- A high percentage of pickup drivers are male, are more likely to be impaired and are more likely to drive aggressively.

The Insurance Institute for Highway Safety published a paper in March 2006, entitled the "Use and Misuse of Motor Vehicle Crash Death Rates in Assessing Highway Safety Performance. This paper concluded that most of the difference between states death rates comes from factors like urban versus rural mileage, along with demographics such as median household income, percentage of population ages 16-20, percentage of population with a college degree and school spending per pupil and not highway safety programs.

D. TRAFFIC SAFETY AREAS OF CONCERN

1. Impaired Driving

Alcohol/drug related crashes accounted for 9.8 percent of all reported traffic crashes during 2005. While this percentage is above the all time low reached in 1996, it is still far below the 22.3% of alcohol related crashes reported during 1983. This percentage has reached a plateau and it appears that it will take an even greater statewide effort to move it lower.

Alcohol/drug related crashes tend to result in more severe injuries than do crashes with no impairment. During the early 1980's, injuries related to alcohol accounted for as much as 36% of the total. Last year, alcohol/drug related injuries were at 17.6% of all injuries. Economic Loss from driver impairment crashes was over 158 million dollars during 2005. Table 19 below presents the impaired crash counts.

Table 19
Alcohol/Drug Related Crashes

Year	All Crashes			Injuries		
	Alcohol Related	All	Percent of All	Alcohol Related	All	Percent of All
1996	2,156	24,882	8.7%	1,722	10,557	16.3%
1997	2,016	22,619	8.9%	1,818	10,688	17.0%
1998	2,142	22,068	9.7%	1,829	10,075	18.2%
1999	2,177	21,078	10.3%	1,771	10,459	16.9%
2000	2,211	22,254	9.9%	1,824	10,798	16.9%
2001	2,035	21,846	9.3%	1,652	8,982	18.4%
2002	2,288	23,527	9.7%	1,745	10,086	17.3%
2003	2,173	23,160	9.4%	1,638	9,632	17.0%
2004	2,113	21,783	9.7%	1,767	9,263	19.1%
2005	2,182	22,373	9.8%	1,623	9,211	17.6%
Chg 1 Year	+3.3%	+2.7%	+1.0%	-8.1%	-0.6%	-7.9%
Chg 5 Year	+0.8%	-0.6%	+2.1%	-5.9%	-5.5%	-0.8%

Source: TIS - Montana Department of Transportation

The National Highway Traffic Safety Administration (NHTSA) has moved away from placing emphasis on the percentage of fatalities that are alcohol related. NHTSA is now

emphasizing the alcohol related fatality rate when comparing states. This rate is acquired by dividing the number of alcohol related traffic fatalities by the number vehicle miles traveled. This data is compiled by NHTSA through the use of the Fatal Analysis Reporting System (FARS) database.

The FARS database inputs the results of BAC tests from the Montana Forensics Lab and hospitals. If no test is performed or received, the alcohol code is generated using a number of other crash factors through a mathematical procedure. The FARS data is the most accurate data available because it is usually based upon BAC results. Timeliness is a problem with the FARS data since results from NHTSA are not available for about a year. The data in Table 20 is based upon FARS data, while most of the other data related to alcohol in this section is derived from the MHP crash records database. This data is based upon perceptions and evidence at the scene.

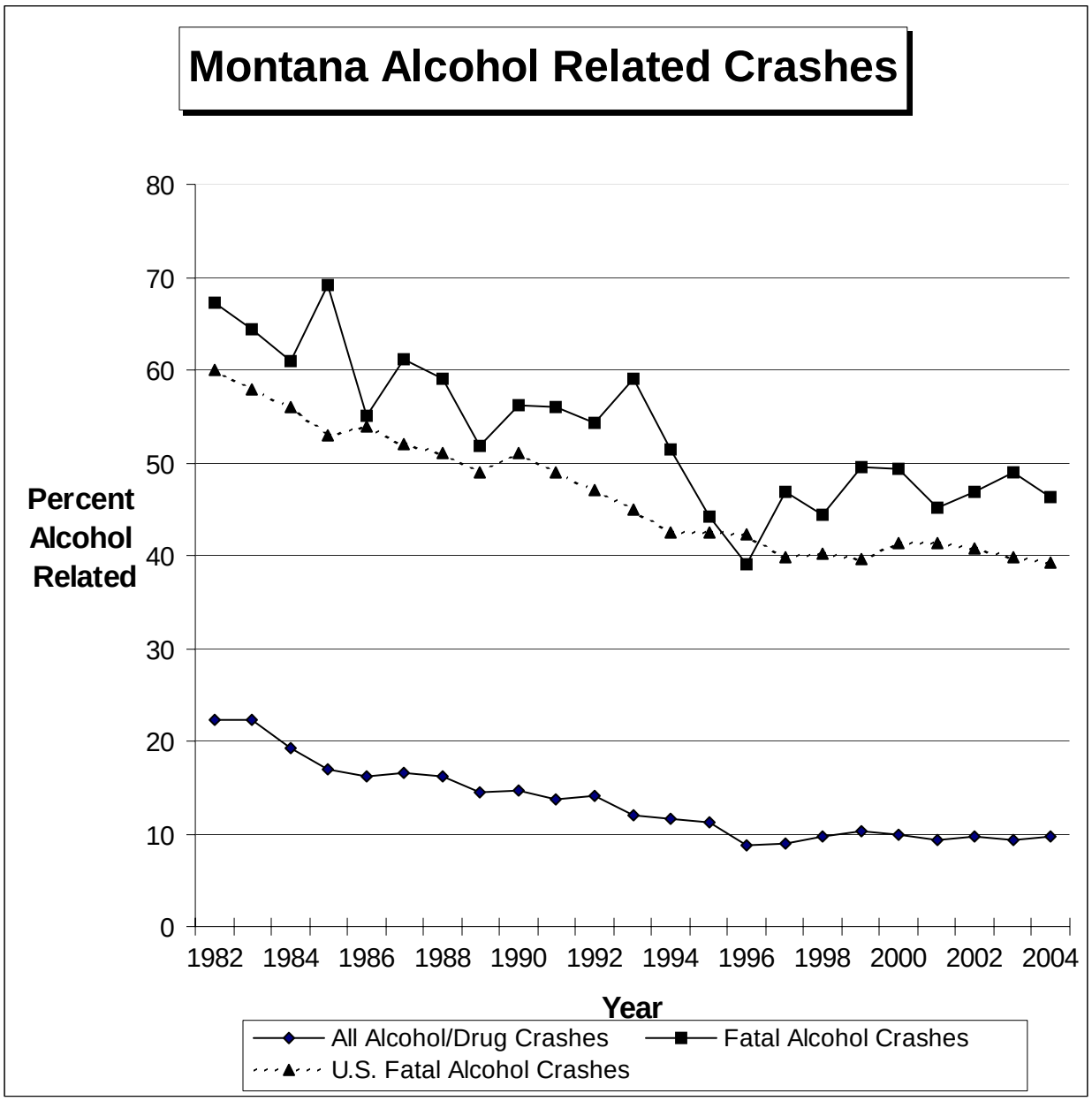
Table 20
Alcohol Fatalities & Fatality Rates

Year	Total Fatalities	Alcohol Related Fatalities	Alcohol Related Percent	Total Fatality Rate	Alcohol Related Fatality Rate
1995	215	95	44.2%	2.29	1.01
1996	200	78	39.0%	2.10	0.83
1997	265	124	46.8%	2.84	1.32
1998	237	105	44.3%	2.50	1.10
1999	220	109	49.5%	2.25	1.11
2000	237	117	49.4%	2.40	1.18
2001	230	104	45.2%	2.30	1.04
2002	269	126	46.8%	2.57	1.20
2003	262	128	48.9%	2.40	1.17
2004	229	106	46.3%	2.04	0.95
Chg 1 Year	-12.6%	-17.2%	-5.3%	-14.6%	-18.8%
Chg 5 Year	-6.0%	-9.2%	-3.5%	-14.0%	-16.7%

Source: Fatal Analysis Reporting System

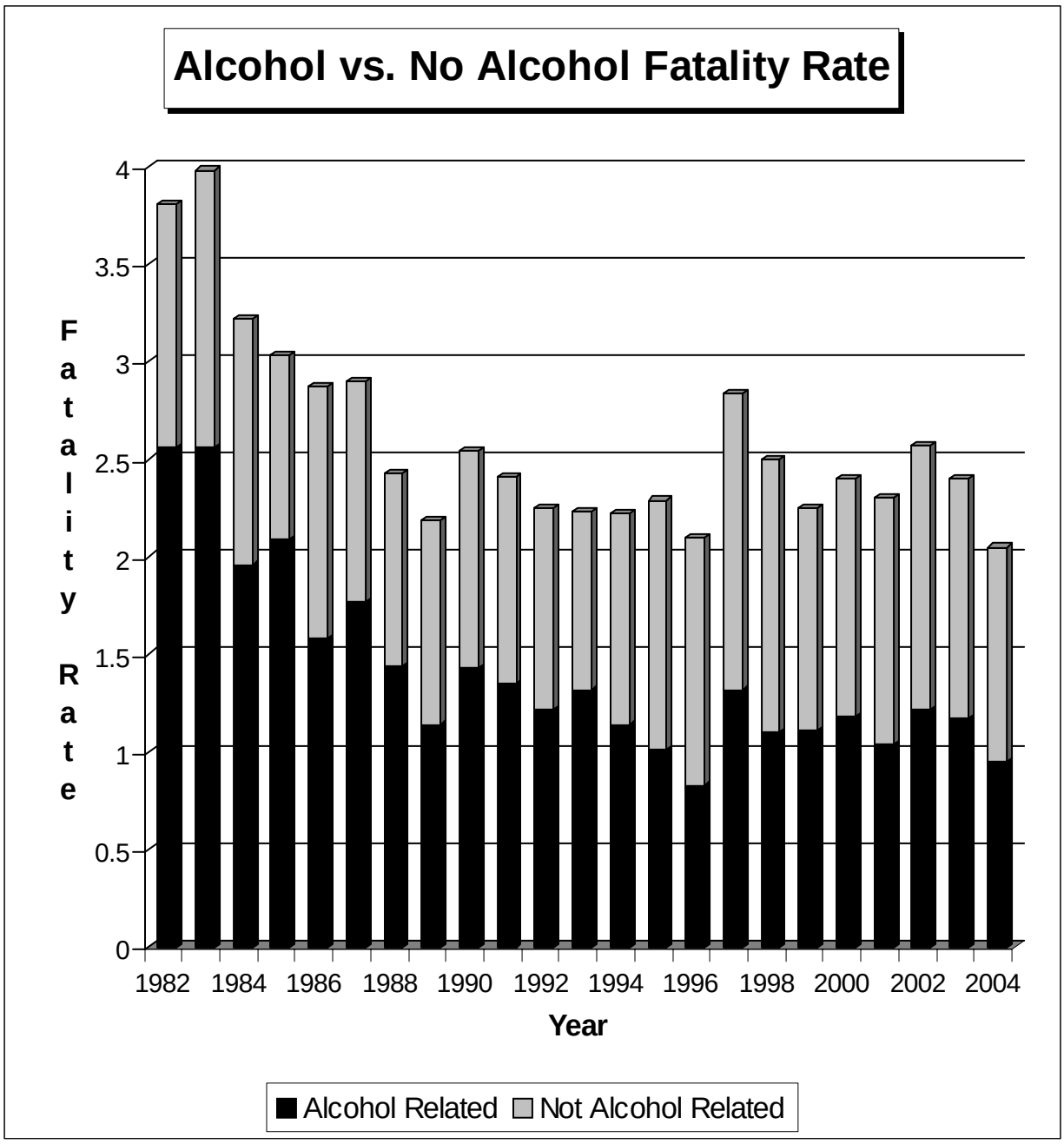
Figure 9 on the following page compares the Montana percentage of alcohol related crashes with the national percentage. The graph in Figure 10 displays alcohol and non-alcohol fatality rates in Montana since 1982. The alcohol fatality rate during 2004 was the lowest since 1996. The final rate during 2005 will be higher.

Figure 9



Source: MDT and NHTSA

Figure 10


Alcohol vs. No Alcohol Fatality Rate
Fatality Rate
4
3.5
3
2.5
2
1.5
1
0.5
0
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
Year
Alcohol Related
Not Alcohol Related

The Montana fatality rate during 1983 was 3.98 and the alcohol related fatality rate that year was 2.56. During the past twenty-one years, the alcohol rate has decreased more than 50%. The lowest rate was reached in 1996 and during the last ten years the rate has been nearly level. The current alcohol related fatality rate for the nation is 0.56 and for Montana the rate is 0.95.

Next, we examine alcohol related crashes by county. The final column of Table 21 displays the percentage of crashes with alcohol/drug involvement in the county. There is a tendency for the larger urban counties to have a lower percentage of alcohol involvement in crashes. It is not known whether this implies counties with higher populations truly have less alcohol involvement because of alcohol education and related activities, or whether the large number of fender benders at intersections makes the percentage of alcohol involvement lower. It is felt that these lower percentages result from a combination of these and possibly other factors. In addition, there are some enforcement agencies, which are not as precise in determining alcohol related involvement, which may cause some counties to show low percentages.

Table 21

Alcohol/Drug Related Crashes by County (2005)

County	Total Crashes	Fatal Crashes	Fatalities	Injuries	Percent Alcohol/Drug Crashes
Beaverhead	29	0	0	22	16.2%
Big Horn	27	7	10	27	15.4%
Blaine	15	2	2	16	22.4%
Broadwater	11	1	1	12	9.1%
Carbon	40	2	2	25	17.1%
Carter	0	0	0	0	0.0%
Cascade	176	6	6	101	8.6%
Chouteau	3	1	1	2	4.7%
Custer	29	3	4	9	16.4%
Daniels	3	0	0	0	12.5%
Dawson	21	0	0	14	8.4%
Deer Lodge	10	1	1	7	8.8%
Fallon	2	0	0	1	4.3%
Fergus	19	2	2	20	7.5%
Flathead	222	4	5	157	10.6%
Gallatin	157	4	5	113	8.0%
Garfield	2	0	0	3	14.3%
Glacier	31	2	3	50	21.2%
Golden Valley	4	1	1	2	20.0%
Granite	6	0	0	4	7.4%
Hill	45	1	1	28	13.0%
Jefferson	30	0	0	14	7.4%
Judith Basin	2	1	2	0	3.8%
Lake	84	7	7	76	16.6%
Lewis & Clark	117	4	5	86	6.7%
Liberty	3	0	0	2	33.3%
Lincoln	47	2	2	50	14.7%
Madison	32	2	2	13	16.6%
McCone	5	0	0	2	21.7%
Meagher	3	1	1	1	9.7%
Mineral	22	1	1	23	7.6%
Missoula	267	4	6	168	10.4%
Musselshell	6	1	1	4	10.9%
Park	47	3	3	29	11.0%
Petroleum	1	1	3	1	8.3%
Phillips	12	1	1	10	19.4%
Pondera	17	0	0	11	17.3%

Table 21 (continued)

Alcohol/Drug Related Crashes by County

County	Total Crashes	Fatal Crashes	Fatalities	Injuries	Percent Alcohol/Drug Related Crashes
Powder River	4	0	0	4	9.5%
Powell	12	0	0	15	5.3%
Prairie	7	0	0	2	14.6%
Ravalli	68	4	4	58	8.7%
Richland	22	1	1	20	8.6%
Roosevelt	37	1	1	51	27.8%
Rosebud	13	2	2	15	7.4%
Sanders	27	2	3	32	14.6%
Sheridan	13	0	0	5	18.3%
Silver Bow	43	1	1	29	6.1%
Stillwater	16	2	2	10	8.0%
Sweet Grass	8	1	2	9	8.6%
Teton	15	0	0	10	13.3%
Toole	15	2	3	13	16.0%
Treasure	2	0	0	1	4.4%
Valley	16	2	2	15	12.0%
Wheatland	4	0	0	4	7.3%
Wibaux	7	3	3	8	20.0%
Yellowstone	305	9	11	219	8.4%
Total	2,182	95	111	1,623	9.8%

Source: TIS -- Montana Department of Transportation

Complete DUI arrest data is not summarized by any agency in Montana. Not all arrests result in a conviction for DUI, since some are dismissed or not prosecuted and others are found not guilty. In lieu of arrest data, we now present conviction data, which is gathered by the Department of Justice. Rates per 1000 population and per million vehicle miles traveled are included in Table 22. Total Convictions were somewhat higher during 2005 than the previous year.

Table 22
DUI Convictions

Year	DUI Convictions	Convictions per 1000 Population	Convictions per Million VMT
1996	6273	7.2	0.67
1997	6217	7.1	0.67
1998	5973	6.8	0.63
1999	6117	6.9	0.63
2000	5787	6.5	0.59
2001	5972	6.6	0.60
2002	5432	6.0	0.53
2003	5343	5.9	0.50
2004	4970	5.4	0.44
2005	5043	5.4	0.45 (est)
Chg 1 Year	+1.5%	---	+2.3%
Chg 5 Year	-8.3%	-11.2%	-15.4%

Source: TIS and Traffic Data Collection - Montana Department of Transportation

Next, data is usually presented for DUI convictions by county and by type of arresting agency. Unfortunately, the Department of Justice is redesigning the databases in the department including the conviction system. While the database has been redesigned, the software for accessing certain types of data is not complete. Because of this, no data by county is available this year.

Table 23 examines the age of the drivers that are involved in alcohol related traffic crashes. Crash rates per licensed driver are calculated. This information can help those in the traffic safety community make decisions on targeting specific age groups concerning the drinking and driving problem. It should be noted that not all drivers involved in these alcohol crashes were drinking. While most alcohol crashes are single car crashes, when there are multiple vehicles involved (792 crashes), some of the drivers may have been not drinking.

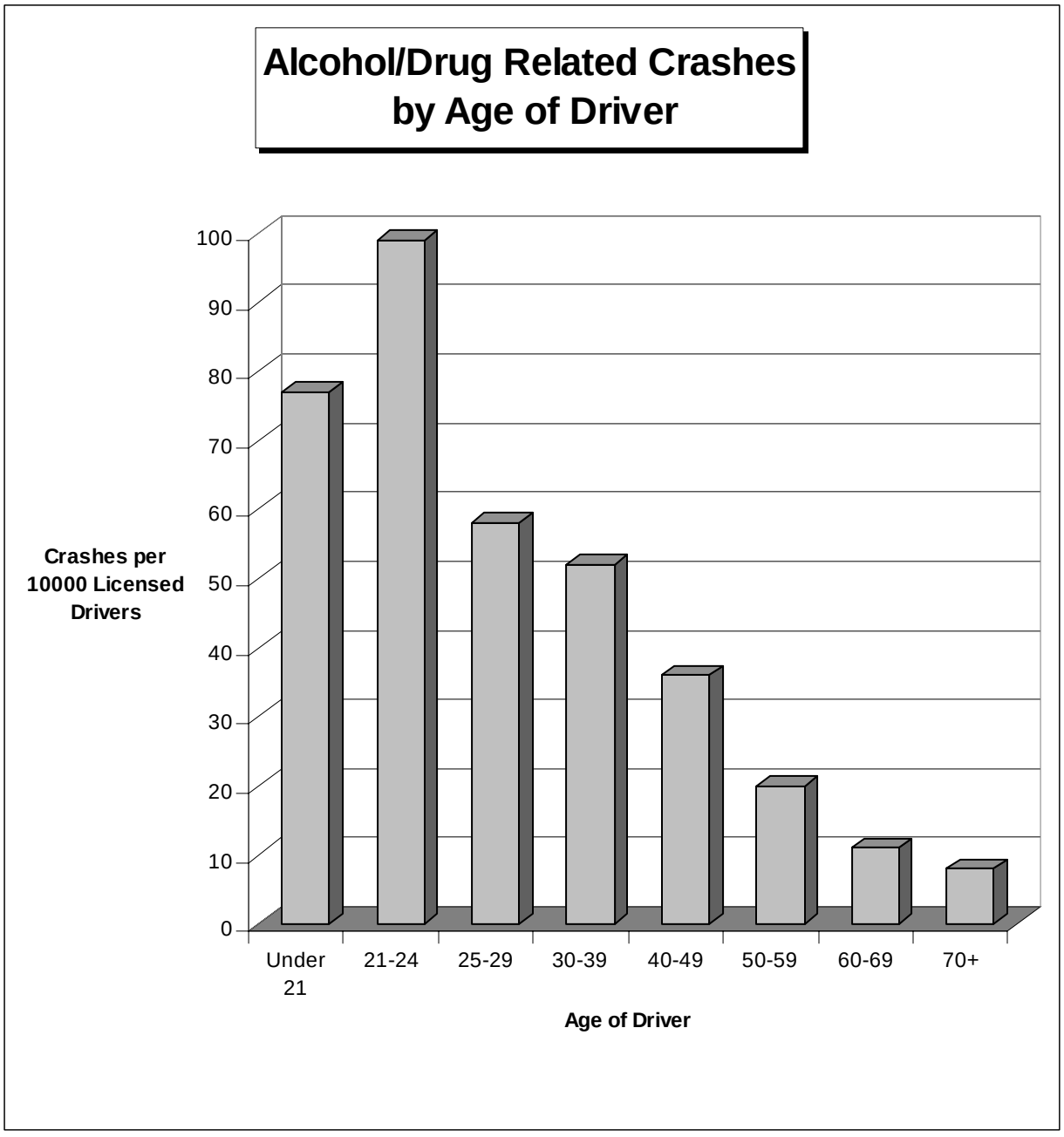
Table 23
Alcohol Related Crashes by Age of Driver
(2005 Crash Data)

Age	Licensed Drivers (2005)	Drivers in Alcohol Crashes	Alcohol Crashes per 10,000 Licenses	Drivers in Fatal Alcohol Crashes	Fatal Alcohol Crashes per 10,000 Licenses
Under 18	24,251	136	56	5	2.1
18-20	36,459	332	91	6	1.6
Under 21	60,710	468	77	11	1.8
21-24	48,770	482	99	10	2.1
25-29	61,653	356	58	17	2.8
30-39	108,394	565	52	31	2.9
40-49	140,895	505	36	21	1.5
50-59	137,970	273	20	14	1.0
60-69	84,261	89	11	12	1.4
70+	72,859	60	8	1	0.1

Source: TIS – Montana Department of Transportation, FARS – Montana Department of Transportation, Motor Vehicle Division – Department of Justice

The highest involved age was the 21-24 year group. For all alcohol related crashes the 18-20 age group is a very close second. Figure 11 on the next page shows these rates by age. It is interesting to compare this chart with Figure 18 on page 67, which shows rates by age for all crashes.

Figure 11


Alcohol/Drug Related Crashes by Age of Driver
Crashes per 10000 Licensed Drivers
100
90
80
70
60
50
40
30
20
10
0
Under 21
21-24
25-29
30-39
40-49
50-59
60-69
70+
Age of Driver

The table below examines "drivers" under age 21 involved in crashes. Those drivers involved in all crashes and in alcohol/drug related crashes are compared. It should be emphasized that the counts are for drivers of age 20 and under (not crashes). There could be a few instances where the young driver had not been drinking, while another older driver involved in the crash had been drinking. Fortunately, most alcohol/drug related crashes involve only one vehicle.

Underage drivers have a lower use of involvement in alcohol/drug related crashes than the entire population of drivers. When young drivers are involved in crashes, 6.6% of those crashes involve alcohol and/or drugs, while the rate is 9.8% for all drivers regardless of age.

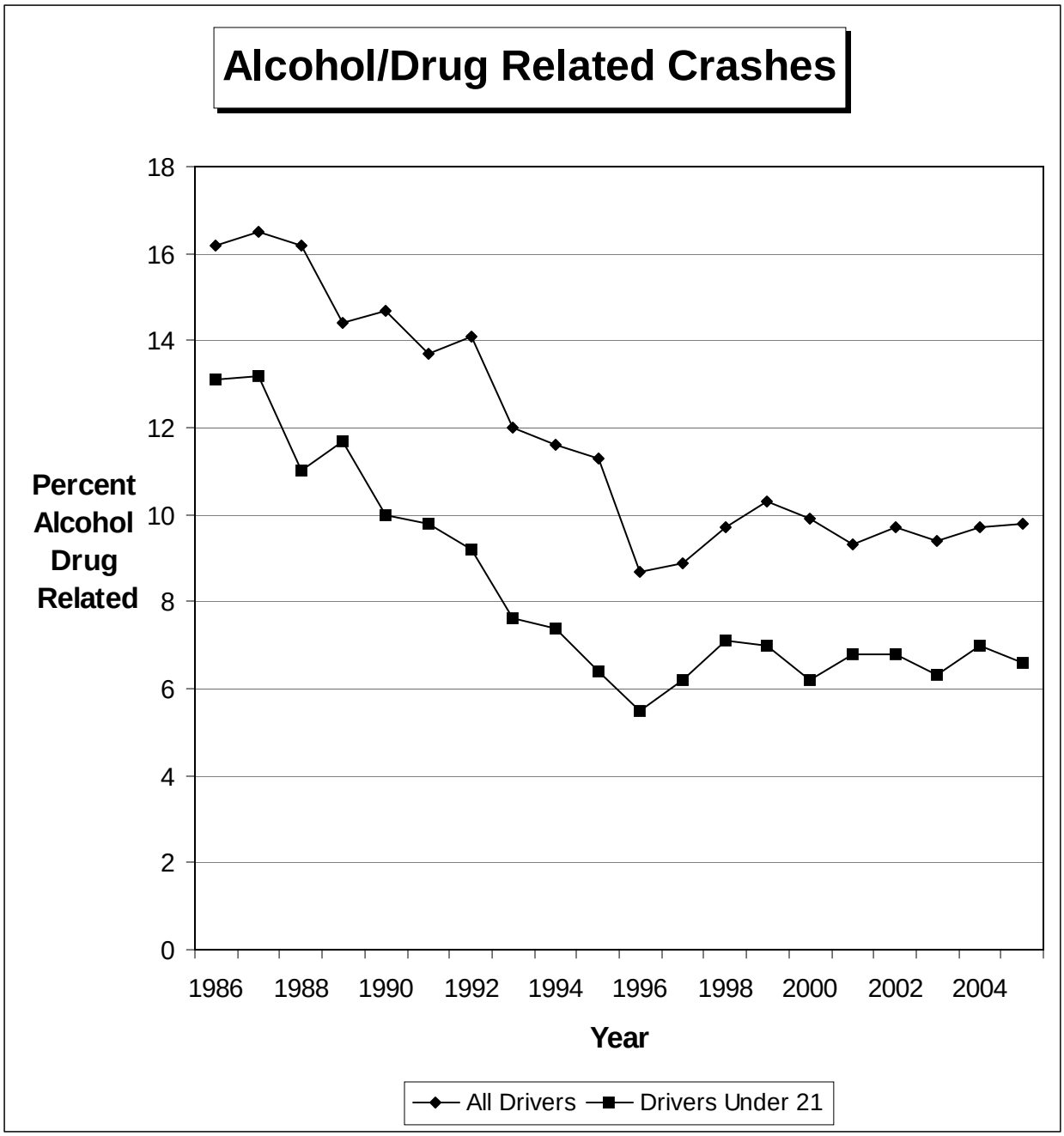
Table 24
Drivers Under 21 – Alcohol/Drug Related Crashes

Year	Young Drivers in All Crashes			Young Drivers In Fatal Crashes		
	Alcohol Related	All	Percent of All	Alcohol Related	All	Percent of All
1996	449	8,196	5.5%	16	46	34.8%
1997	491	7,958	6.2%	19	47	40.4%
1998	534	7,503	7.1%	14	44	31.8%
1999	497	7,064	7.0%	23	55	41.8%
2000	497	7,969	6.2%	13	49	26.5%
2001	531	7,781	6.8%	13	40	32.5%
2002	558	8,224	6.8%	16	47	34.0%
2003	473	7,551	6.3%	18	57	31.6%
2004	499	7,090	7.0%	17	39	43.6%
2005	468	7,096	6.6%	11	37	29.7%
Chg 1 Yr	-6.2%	+0.1%	-5.7%	-35.3%	-5.1%	-31.9%
Chg 5 Yr	-8.5%	-8.1%	-0.3%	-28.6%	-20.3%	-11.7%

Source: TIS – Montana Department of Transportation

Figure 12 on the following page examines these trends over time. A general decline for percentage of alcohol/drug related crashes occurred until 1995. From 1996 until 2005, this percentage has leveled.

Figure 12


Alcohol/Drug Related Crashes
Percent Alcohol Drug Related
18
16
14
12
10
8
6
4
2
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
Year
All Drivers
Drivers Under 21

2. Occupant Protection

Montana's seat belt law became effective on October 1, 1987, without penalties. Penalties became effective on January 1, 1988. The law was written for secondary law enforcement and covered all seating positions within vehicles. Although, there must be another reason for stopping a vehicle, the law has been very effective. Montana is one of only fourteen states where all seating positions are covered. Only three standard enforcement states cover all positions. A bill for standard enforcement had been introduced to the Montana legislature during three sessions and did not made it out of committee during the first two attempts. During the 2005 legislative session, a bill passed the Senate and was within nine votes of passing the House. Another attempt will be made during 2007. Passage of standard enforcement will usually raise seat belt usage from 8 to 12 percentage points.

Montana's restraint usage rates are shown on the next page in Table 25. These rates are determined from an approved NHTSA observational survey. The survey is conducted each year during June at 120 locations statewide.

Montana restraint usage increased from 16.8% in 1984 to 33.3% in October 1987 before the mandatory seat belt bill became law. This gain was acquired by conducting seat belt incentive give away campaigns in many of Montana's cities along with public information campaigns. When the enforcement of the law began, usage jumped to 56% and has gradually increased since that time. The current level of usage is 79.0%. Usage has declined during each of the last two year. While each yearly decline was not statistically significant, the two year decline is marginally significant.

Usage is usually two to three percentage points higher in summer than in winter, spring and fall on Montana roadways. This cycle is likely caused by a greater percentage of short trips during the winter. Tourists are more prevalent in the summer accounting for a larger percentage of long trips and thereby higher usage. In addition, families traveling together tend to have higher usage than when there is just one person in the vehicle. A higher percentage of vehicles contain more than one person during the summer in Montana.

The usage rates on all roadway strata types except interstate decreased during 2006. The strata types with the lowest usage are "city" and "other" (county and secondary). However, the chance of a crash is highest on these roads, and serious injury is still quite possible.

Table 25
Seat Belt Usage Rates

Year	Interstate	Primary	City	Other	All Roads
1984	24.7%	20.7%	8.4%	8.4%	16.8%
1986	43.4%	33.9%	14.8%	17.1%	29.5%
1987	54.8%	44.0%	24.0%	27.0%	39.7%
1988	75.8%	64.7%	41.2%	45.6%	59.5%
1989	78.6%	69.3%	40.6%	47.5%	61.8%
1990	79.1%	70.5%	40.2%	48.4%	62.6%
1991	80.9%	72.8%	41.4%	49.3%	64.5%
1992	83.1%	75.3%	47.8%	53.7%	68.0%
1993	84.2%	75.9%	49.6%	56.2%	69.2%
1994	84.7%	75.4%	51.1%	56.4%	69.6%
1995	86.4%	75.0%	51.3%	57.5%	70.1%
1996	86.2%	75.5%	51.8%	61.0%	70.8%
1997	87.9%	79.3%	52.4%	60.2%	72.6%
1998	88.4%	78.2%	54.0%	63.5%	73.1%
1999	89.1%	78.9%	55.3%	65.0%	74.0%
2000	91.3%	79.5%	58.3%	65.5%	75.6%
2001	92.5%	79.6%	59.7%	65.7%	76.3%
2002	94.3%	82.5%	60.8%	69.7%	78.4%
2003	93.6%	82.3%	65.1%	71.7%	79.5%
2004	93.0%	83.3%	67.7%	73.1%	80.9%
2005	92.6%	82.4%	66.9%	72.6%	80.0%
2006	92.6%	81.7%	64.9%	70.6%	79.0%
Chg 1 Year	---	-0.8%	-3.0%	-2.8%	-1.1%
Chg 5 Year	-0.6%	-0.4%	+1.3%	+0.1%	---

Source: State Highway Traffic Safety Office – Montana Department of Transportation

On the following page, Figure 13 shows a graph of Montana's seat belt usage since 1983.

Figure 13

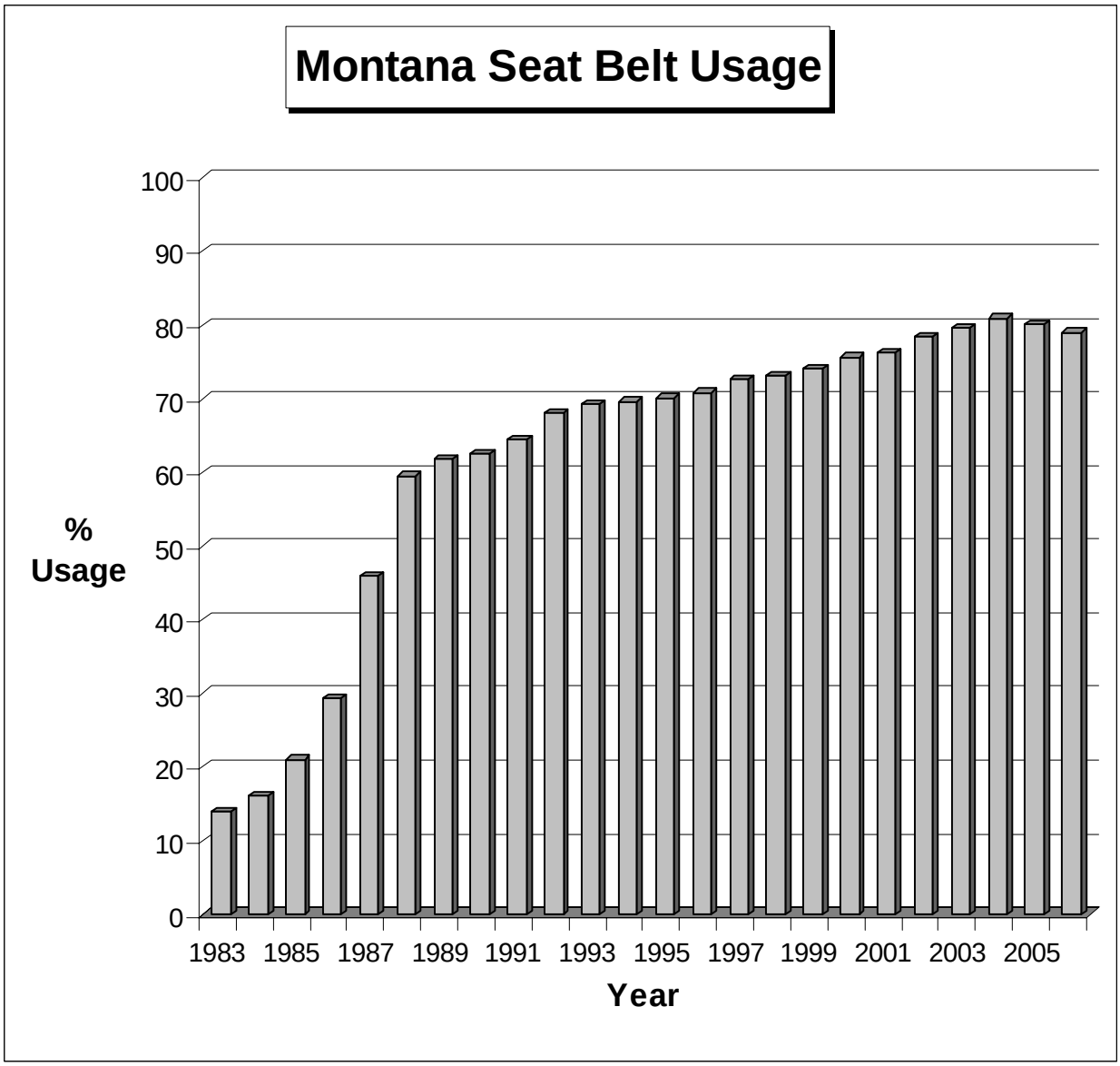

Montana Seat Belt Usage
100
90
80
70
60
50
40
30
20
10
0
% Usage
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
Year

Table 26 on the following page shows seat belt convictions by arresting agency. Over 14,000 convictions resulted from seat belt citations issued during 2005. This is slightly less than the convictions, which resulted from 2004 citations.

The Montana Highway Patrol wrote over 71% of the convictions statewide, which was a decrease from 2004. Police departments accounted for over 22% of statewide citations, up somewhat from 2004. Sheriff departments wrote more citations that resulted in convictions than any previous year except 2004. This accounted for about 6% of the statewide total. Even larger increases in local enforcement may be required in order to encourage higher usage on local roads and city streets.

Montana restraint usage has been growing slowly over the past few years. Many smaller local enforcement agencies, do not write significant numbers of seat belt citations. However Havre, Columbia Falls, Laurel, Miles City, Sidney, Glendive, Dillon, Polson, Bridger and Joliet do write a relatively large amount of citations for the respective size of community.

The number of convictions resulting from citations written by sheriff departments has increased during the past fifteen years. In the past, Missoula and Silver Bow counties accounted for over 90% of these convictions. Several additional counties are beginning to write some seat belt citations, so that Missoula and Silver Bow only accounted for 74% of the convictions during 2005. The Bureau of Indian Affairs and/or Tribal Police issue very few citations that result in convictions reported to the Montana Department of Justice. However, these citations often are not sent to the Department of Justice. Restraint usage on most of Montana's reservations continues to be quite low.

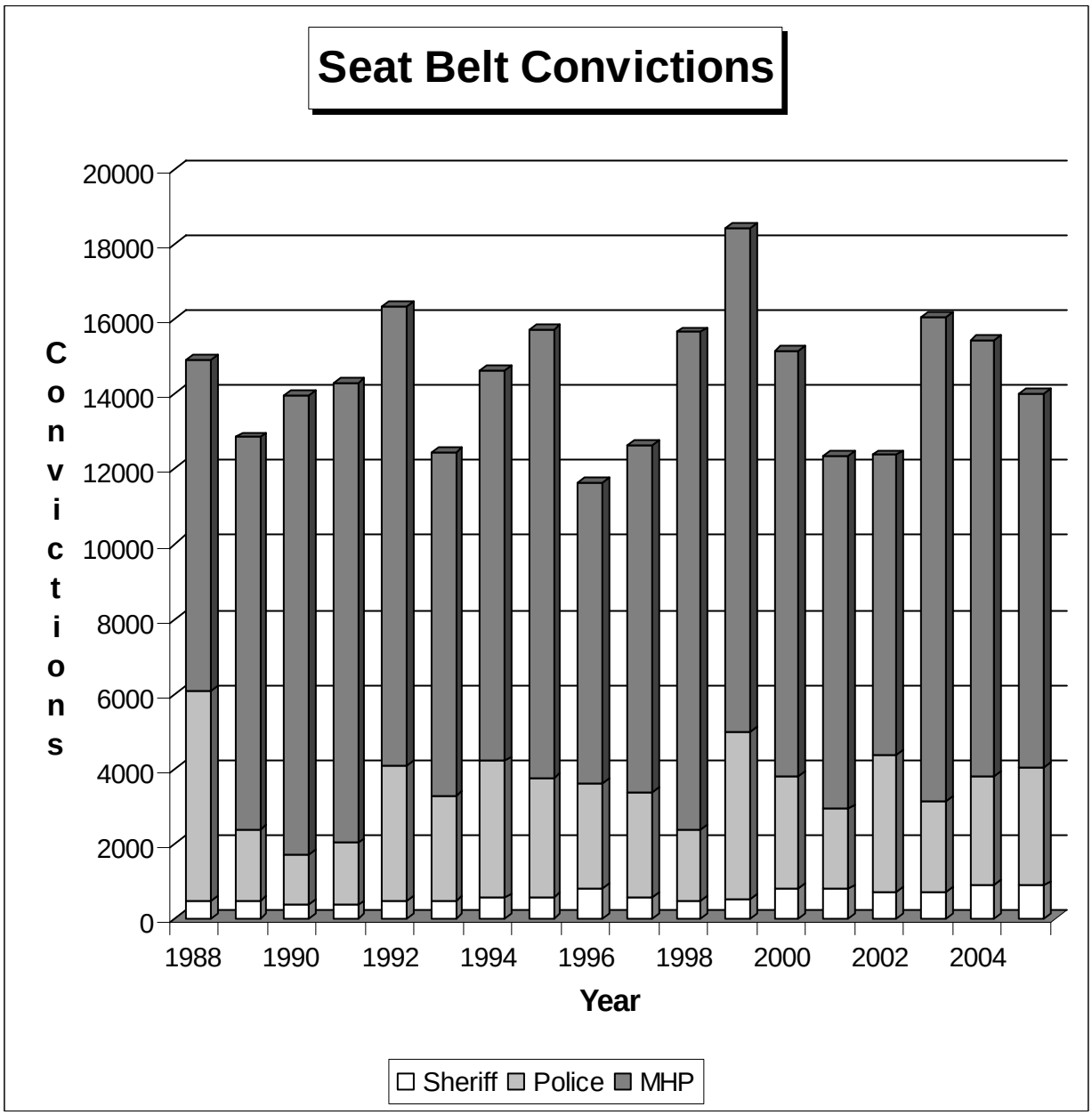
Table 26
Seat Belt Citation Convictions by Issuing Agency

Year	Police	Sheriff	MHP	Reservation Law Enf.	Total
1988	5,612	478	8,818	0	14,908
1989	1,907	483	10,463	0	12,853
1990	1,316	379	12,277	0	13,972
1991	1,658	355	12,269	15	14,297
1992	3,611	453	12,283	62	16,409
1993	2,799	474	9,192	106	12,571
1994	3,654	546	10,445	70	14,715
1995	3,173	585	11,986	38	15,782
1996	2,784	816	8,053	5	11,658
1997	2,798	567	9,289	11	12,665
1998	1,911	461	13,290	75	15,737
1999	4,453	521	13,458	32	18,464
2000	3,027	792	11,342	30	15,191
2001	2,140	785	9,460	9	12,394
2002	3,680	702	8,015	11	12,408
2003	2,418	724	12,989	2	16,133
2004	2,928	926	11,911	3	15,768
2005	3,155	880	9,964	2	14,001
Chg 1 Year	+7.8%	-5.0%	-16.4%	-33.3%	-11.2%
Chg 5 Year	+11.1%	+12.0%	-7.3%	-81.8%	-2.6%

Source: TIS – Montana Department of Transportation

Figure 14 on the next page shows convictions during the seventeen years of the law.

Figure 14


Seat Belt Convictions
Convictions
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
1988
1990
1992
1994
1996
1998
2000
2002
2004
Year
Sheriff
Police
MHP

Restraint usage acquired from crash reports is analyzed next. Usage as reported by the investigating officer, is quite accurate in the case of fatalities. Even if the person is no longer in the vehicle, physical evidence makes it easy to correctly code this information. For persons injured in crashes, accurate coding of this field becomes more difficult. Generally, the investigating officer must rely on the honesty of the occupants when acquiring this data. The following table displays restraint use for occupant fatalities. Restraint usage is much lower for fatalities than for the overall population. There are thought to be two reasons for this. The first is that people that drive in a manner that tends to result in fatalities, are often under the influence of alcohol and/or drugs, are speeding or are involved in other hazardous driving. It has been shown in studies that these people tend to use restraints much less often—risk takers tend to be risk takers in many life choices. The second factor is that the occupants in crashes without belts are much more likely to die than those occupants wearing belts.

Table 27
Restraint Use for Occupant Fatalities in Crashes

Year	Not Belted	Belted	Total Occupants	Percent Belted
1996	130	45	175	25.7%
1997	178	59	237	24.9%
1998	153	56	209	26.8%
1999	156	39	195	20.0%
2000	144	60	204	29.4%
2001	153	56	209	26.8%
2002	176	54	230	23.5%
2003	167	65	232	28.0%
2004	143	48	191	25.1%
2005	152	50	202	24.8%
Chg 1 Year	+6.3%	+4.2%	+5.8%	-1.2%
Chg 5 Year	-2.9%	-11.7%	-5.3%	-6.6%

Source: Fatal Analysis Reporting System (FARS)

Note that the total fatalities shown in this table is not the same as in other tables throughout this paper. This table only shows occupant fatalities and does not include, motorcyclists, pedestrians and bicyclists.

Next is presented seat belt usage by vehicle type for occupant fatalities within Montana. Data is shown for crashes occurring during 2003 through 2005. Usage was much lower for pickups than for other types of vehicles.

Table 28
Seat Belt Usage of fatalities by Vehicle Type (2003-2005)

Vehicle Type	Usage
Pickups	16.9%
Passenger Cars	29.9%
SUV's	32.5%
Minivans	38.1%
Vans	25.0%

Source: Fatal Analysis Reporting System (FARS)

In the Table 29, it is shown that seat belt use is much lower (less than one-third) in crashes that are alcohol related than for those without alcohol involvement. Use in crashes without alcohol and drug involvement is 39.0% compared to 10.8% in those with alcohol and drugs.

Table 29
Seat Belt Usage versus Alcohol Involvement Fatal Crashes – 2004

		Seat Belt Used	Seat Belt Not Used	Unknown	Total
Alcohol Related	Fatalities	11	90	1	102
	Percent	10.8%	88.2%	1.0%	100.0%
Not Alcohol Related	Fatalities	39	58	3	100
	Percent	39.0%	58.0%	3.0%	100.0%
Total	Fatalities	50	148	4	202

Source: Fatal Analysis Reporting System (FARS)

The next table shows restraint usage for injured occupants in crashes. The usage in this table is much higher than that reported in the fatality table. This is due to three things: 1) occupants in injury crashes are not as likely to be involved in speeding, driving under the influence and hazardous driving actions and also tend to wear restraints more often, 2) Some of these occupants are not telling the truth about restraint usage and 3) survivors often survive simply because they were belted. Occupant usage for uninjured occupants is even higher and is usually above the observed average statewide usage.

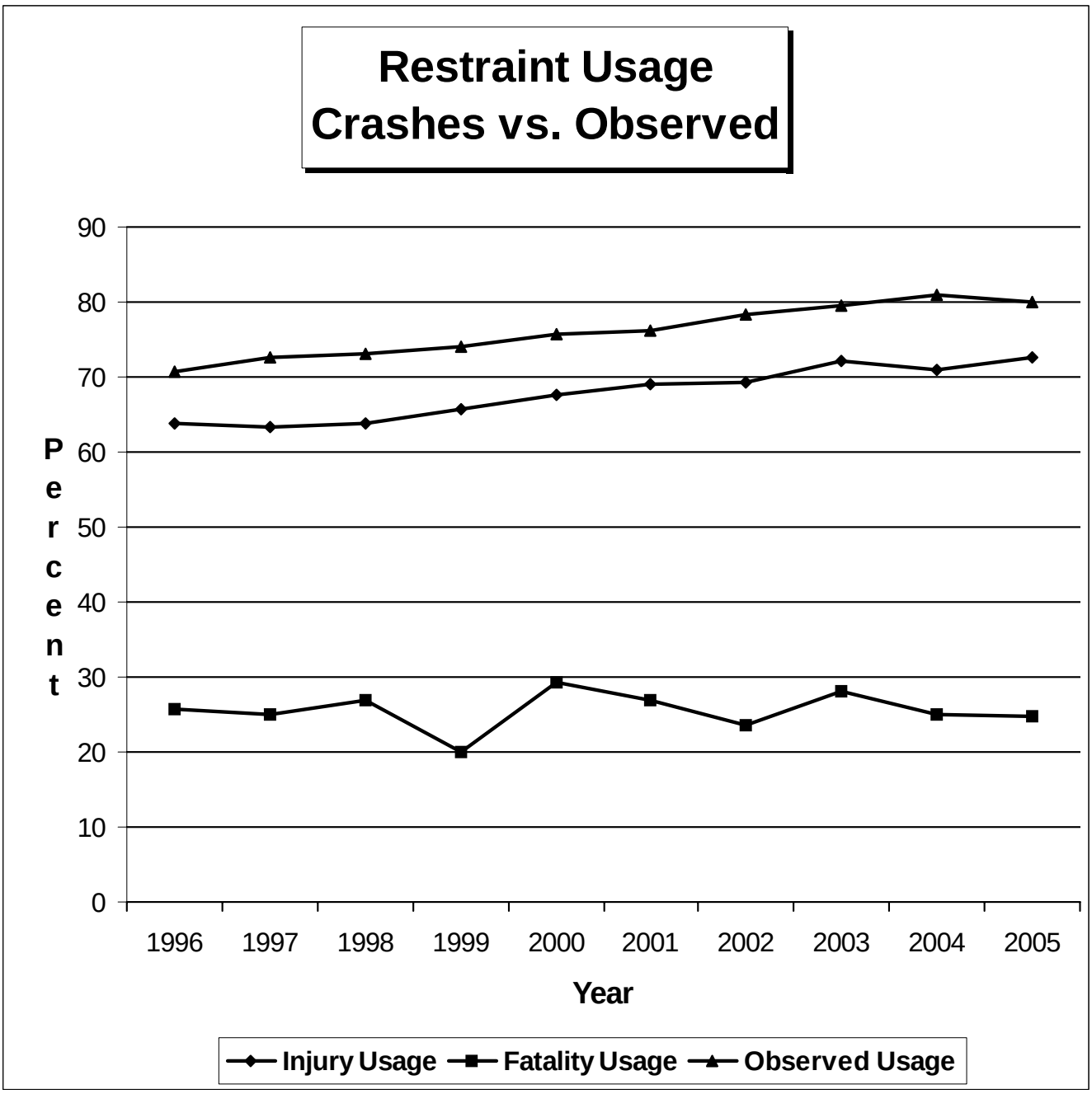
Table 30
Restraint Use for Occupant Injuries in Crashes

Year	Not Belted	Belted	Total Occupants	Percent Belted
1996	3,202	5,628	8,830	63.7%
1997	3,164	5,449	8,613	63.3%
1998	2,954	5,195	8,149	63.8%
1999	2,899	5,566	8,465	65.8%
2000	2,814	5,910	8,724	67.7%
2001	2,203	4,929	7,132	69.1%
2002	2,462	5,561	8,023	69.3%
2003	2,182	5,651	7,833	72.1%
2004	2,264	5,551	7,815	71.0%
2005	2,121	5,650	7,771	72.7%
Chg 1 Year	-6.3%	+1.8%	-0.6%	+2.4%
Chg 5 Year	-11.1%	+2.3%	-1.7%	+4.1%

Source: TIS - Montana Department of Transportation

This usage has been increasing during the past ten years. The amount of increase seems to be similar to the state usage survey increases. Figure 15 on the following page shows usage from the previous two tables along with annual observed usage in Montana. The injury usage from crash reports seems to track about six to nine percent below the observed usage. This tends to validate the seat belt sample since both percentages change at about the same rate.

Figure 15


Restraint Usage
Crashes vs. Observed
90
80
70
60
50
40
30
20
10
0
Percent
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year
Injury Usage
Fatality Usage
Observed Usage

Fatalities and injuries to vehicle occupants whose ages are fourteen and under are of interest in relation to child safety and child restraint usage. The following table displays the history of occupant injury data over the last ten years. Injuries generally decreased from 1996 to 2005. During the early 1970's, the fatalities for this age group 0-4 were usually between five and ten. When child restraints became more common, these numbers dropped.

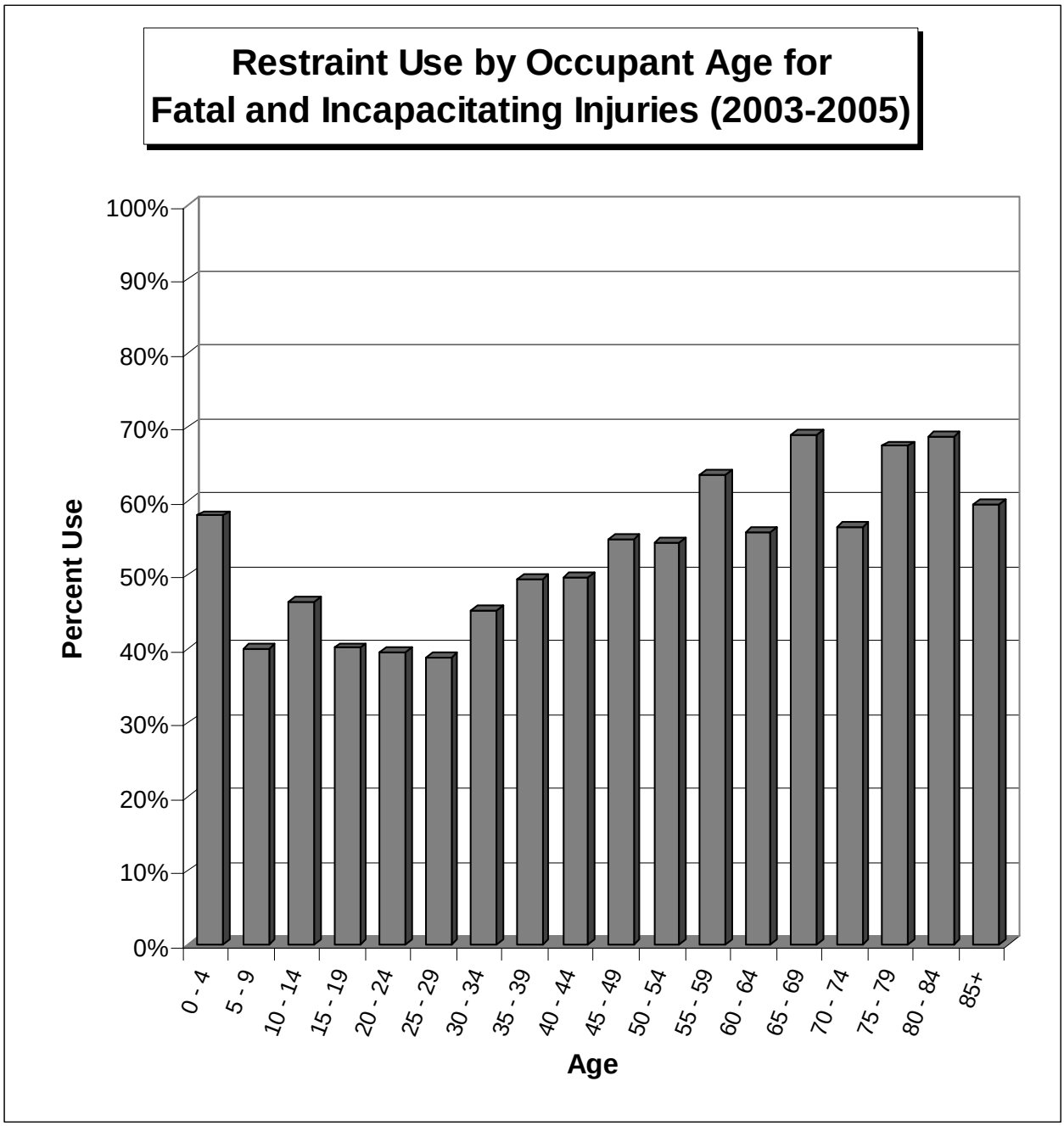
Table 31
Occupant Injuries – Age Fourteen and Under

Year	Fatalities		Injuries	
	0-4	5-14	0-4	5-14
1996	6	6	321	672
1997	6	6	312	668
1998	3	7	278	626
1999	1	5	275	652
2000	4	10	242	693
2001	1	13	207	475
2002	1	6	220	593
2003	4	8	231	593
2004	1	4	210	562
2005	4	5	221	521
Change 1 Year	+300%	+25.0%	+5.2%	-7.3%
Change 5 Year	+81.8%	-39.0%	-0.4%	-10.1%

Source: TIS - Montana Department of Transportation

Restraint usage by age cannot be determined from the observational survey. We can analyze belt use data in crashes and acquire a general idea of how usage in Montana varies by age. In order to show significance, crash information for the last three years was analyzed (2003 – 2005). Usage is shown on the following page in Figure 16.

Figure 16


Restraint Use by Occupant Age for
Fatal and Incapacitating Injuries (2003-2005)
Percent Use
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 4
5 - 9
10 - 14
15 - 19
20 - 24
25 - 29
30 - 34
35 - 39
40 - 44
45 - 49
50 - 54
55 - 59
60 - 64
65 - 69
70 - 74
75 - 79
80 - 84
85+
Age

3. Hazardous Actions, Speed and License Compliance

a. Speed and Driver Contributing Circumstances

The current speed limits became law on Memorial Day weekend of 1999. The limit on the interstate was set at 75, while the limit on most other non-interstate routes was set at 70 mile per hour. Night speeds are 75 on the interstate and 65 on non-interstate routes. Trucks have limits that are slower on some roads.

There is a correlation between alcohol related crashes and exceeding the speed limit in fatal crashes as shown in the table below. Vehicles were speeding in 51.7% of alcohol related crashes and in only 26.0% of the non-alcohol related crashes.

Table 32
Speed versus Alcohol Involvement
Fatalities - 2005

		Speeding	Not Speeding	Total
Alcohol Related	Fatalities	62	58	120
	Percent	51.7%	48.3%	100.0%
Not Alcohol Related	Fatalities	34	97	131
	Percent	26.0%	74.0%	100.0%
Total		96	155	251

Source: Fatal Analysis Reporting System (FARS)

Characteristics recorded about the driver and his or her actions leading up to crashes are now examined. Inattentive Driving is the major contributing circumstance in crashes. Inattentive driving is an overall category for not concentrating on the task of driving and is very subjective as determined by the investigating officer. It is apparent that drivers are doing other things in their car besides driving, such as eating, smoking, talking on cell phones, adjusting controls, inserting tapes or CD's, looking at GPS mapping, and many other activities. There are more possible distractions in our busy and electronic world and many of these seem to be taking a priority over actually operating a car. Cell phone use was admitted to as a contributor in 101 crashes and was likely a distraction in many more. This number is increasing on a yearly basis as shown in Table 33.

Table 33
Inattentive Driving and Distractions

Year	Inattentive Driving	Fell Asleep	Cell Phone
1996	7,083	533	--
1997	7,422	507	--
1998	7,051	531	--
1999	7,106	594	--
2000	7,326	547	--
2001	7,290	499	--
2002	7,768	542	62
2003	7,380	564	62
2004	7,148	573	78
2005	7,285	522	101
Change 1 Year	+1.9%	-8.9%	+29.5%
Change 5 Year	-1.3%	-4.2%	---

The most common contributing circumstances involving drivers in crashes, as determined by the investigating officer, are summarized in Table 34. Careless Driving has been higher over the last few years. During 1996, crash investigators decided that careless driving was one of the contributors to the crash in 3,924 instances, while it was a contributor in over 5,800 instances for each year since 2002. Following too closely is also beginning to show an upward trend, while Improper Turn and Improper backing are trending downward.

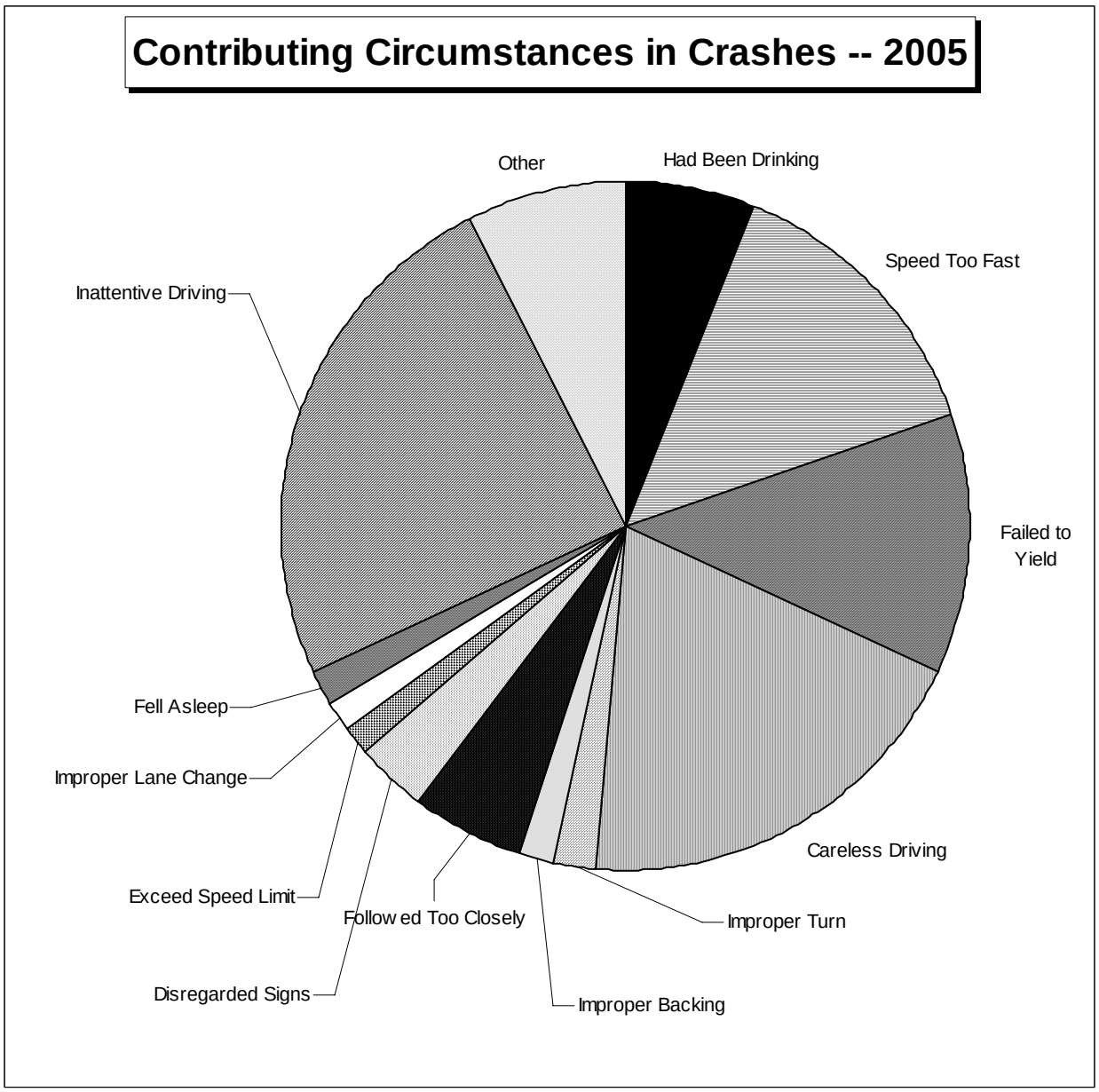
Table 34
Contributing Circumstances Actions Involving Driver

Year	Alcohol	Speed Too Fast	Failed to Yield	Careless Driving	Follow Too Closely	Improper Turn	Improper Backing	Total
2005	1,866	4,074	3,636	5,861	1,656	536	466	18,095

Source: TIS – Montana Department of Transportation

The acquisition of a numerical speed limit in May 1999 affected the category of hazardous actions. Figure 17 on the following page shows a percentage breakout for driver's hazardous actions in crashes for 2005.

Figure 17


Contributing Circumstances in Crashes -- 2005
Other
Had Been Drinking
Speed Too Fast
Inattentive Driving
Failed to Yield
Fell Asleep
Improper Lane Change
Careless Driving
Exceed Speed Limit
Followed Too Closely
Improper Turn
Disregarded Signs
Improper Backing

b. Driver's License Compliance:

The next table examines the license status of each driver at the time of involvement in an injury or fatality crash. Only the most common status codes are included in the table. The addition of a short crash reporting form, which doesn't capture status of the driver's license has complicated this table. Since short forms are used on some Property Damage Only crashes, this table excludes all property damage crashes and examines injury crashes only to assure data consistency over the ten year period.

Table 35
License Status for Drivers in Injury Crashes
(Injury crashes only)

Year	Valid License	No License	Proba-tionary	Expired	Suspended	Revoked
1996	11,292	341	59	135	156	148
1997	10,787	360	46	160	219	122
1998	9,883	333	52	151	213	120
1999	9,984	320	51	155	289	150
2000	10,570	320	63	102	280	145
2001	8,908	299	49	75	239	119
2002	9,784	314	49	88	294	112
2003	9,263	296	40	78	304	114
2004	8,947	307	42	73	289	112
2005	9,036	278	35	69	271	100
Chg 1 Yr	+1.0%	-9.4%	-16.7%	-5.5%	-6.2%	-10.7%
Chg 5 Yr	-4.8%	-9.5%	-28.0%	-17.1%	-3.6%	-16.9%

Source: TIS – Montana Department of Transportation

Drivers involved in crashes while driving with a suspended license have increased significantly in the last ten years. During 1996 there were 156 of these occurrences and this count reached 271 in 2005. Drivers with no license during a crash are decreasing slightly.

4. Traffic Records

Traffic safety data and specifically crash data are an important part of any highway safety program. Without timely and relevant data, a traffic safety program cannot operate efficiently. Countermeasures cannot be developed without the ability to determine where problem areas occur. NHTSA requires the Highway Safety Plan to be data driven and this requires comprehensive, timely data systems.

During April 2004, a Traffic Records Assessment was conducted for Montana. This assessment report discusses the positives and negatives of traffic records concerning highway safety in the state. Many recommendations were suggested in this report. The most important recommendation is that Montana needs to formalize a two-tiered Traffic Records Coordinating Committee across multiple agencies and jurisdictions. The working committee has been established and has met several times. There will not be an active executive committee. Instead, a memorandum of understanding between the agencies has been drawn up and signed. Members of the working committee will contact directors in their agencies as needed.

Cambridge Systematics completed a Traffic Records Strategic Plan during January of 2006. Since we have met the basic requirements, Montana has applied for NHTSA 408 funding designated for the improvement of Traffic Records systems within the state. If funds are received work can begin on the records systems.

During the most recent Traffic Records Coordinating Committee meeting, it was decided to fund individual systems and to begin the development of a design document concerning the linking of data systems during the first years of the grant. The linking of data systems across department boundaries requires budget and information technology approvals from the individual Departments and the Department of Administration. Since this will be a time consuming process which will require months or even years, it was felt that this portion of the plan be put off to later years.

At present, a court tracking system has been deployed to most courts in Montana. The software is called Full Court. Information from the citation is entered into the database along with adjudication information. Currently the Department of Justice and the Office of Court Administration are working toward uploading this information in order to update the Driver History file. It is hoped that eventually summaries of conviction information can be acquired from this court data.

The last part of a citation tracking system would be to allow for entry of citation information at the law enforcement level. If this data could be uploaded to the appropriate court, then true tracking could exist.

The Department of Justice is currently examining their business practices related to Vehicle Registration, Driver Licensing and Driver Improvement. This project is requiring major changes in their data files and information exchange. They are in the middle of this process and the resulting improvements should greatly affect data availability,

linking and exchange. These changes should give better driver histories resulting in quicker and more accurate action, and will provide better available data to law enforcement, judges, prosecutors and highway safety advocates.

5. Emergency Medical Services

Emergency Medical Services differs from many program areas that are related to Traffic Safety because there is no intention of affecting the number of crash occurrences. Theoretically, better EMS will reduce the number of fatalities and complications from severe injuries. Table 36 lists the total number of crashes involving either fatalities or incapacitating injuries by county. This provides a basis for approximating the need of EMS as related to traffic crashes in each county.

Table 36
Severe Injury Crashes by County – 2005

County	Severe Crashes	County	Severe Crashes
Beaverhead	26	McCone	1
Big Horn	28	Meagher	4
Blaine	9	Mineral	25
Broadwater	12	Missoula	187
Carbon	25	Musselshell	8
Carter	1	Park	20
Cascade	58	Petroleum	3
Chouteau	10	Phillips	7
Custer	13	Pondera	4
Daniels	0	Powder River	3
Dawson	7	Powell	18
Deer Lodge	12	Prairie	0
Fallon	3	Ravalli	65
Fergus	14	Richland	13
Flathead	176	Roosevelt	17
Gallatin	79	Rosebud	13
Garfield	1	Sanders	32
Glacier	21	Sheridan	4
Golden Valley	3	Silver Bow	34
Granite	19	Stillwater	20
Hill	10	Sweet Grass	12
Jefferson	27	Teton	5
Judith Basin	5	Toole	6
Lake	49	Treasure	5
Lewis and Clark	58	Valley	4
Liberty	1	Wheatland	4
Lincoln	37	Wibaux	5
Madison	22	Yellowstone	128

Source: TIS – Montana Department of Transportation

The county with the most severe crashes in Montana was Missoula with 187. Flathead County is not far behind with 176 severe crashes and Yellowstone County follows with 128. After these three counties, there is a significant drop in numbers to Gallatin with 79, Ravalli with 65 and then Cascade and Lewis & Clark with 58.

The EMS and Injury Prevention Section is moving forward in the development and/or acquisition and implementation of a new Trauma Records database and a new statewide Trip Reports database. The first system will allow for a comprehensive trauma database, which may be able to tie into CODES applications. This second system will allow the tracking of detailed information of many variables concerning ambulance runs including data related to treatment and procedures given to patients, quality control, response times and much more. The EMS & IP Section conducted an EMS assessment during June 2005. The results of this assessment should help them direct their efforts during the future.

Computers exist in most of the ambulance services in the state, but are in serious need of updating. The services use these computers for training. In addition, the computers will be used for entry of ambulance trip report data. A subset of this data will be transferred to the state EMS Bureau for statewide informational purposes.

6. Young Drivers and Senior Drivers

This section examines the age of the drivers that are involved in traffic crashes. Crash rates per one thousand licensed drivers are calculated. This data provides additional information to improve decisions on targeting specific high-risk age groups. Table 37 contains this age related data.

Table 37
Crashes by Age of Driver
(2005 Crash Data)

Age	Licensed Drivers (2005)	Drivers in Crashes	Crashes per 1000 Licenses	Drivers in Fatal Crashes	Fatal Crashes per 1000 Licenses
Under 16	5,080	843	186	6	1.18
16	8,845	1,229	139	4	0.45
17	10,326	1,277	124	2	0.19
18	11,424	1,340	117	12	1.05
19	12,452	1,266	102	6	0.48
20	12,583	1,141	91	7	0.56
Under 21	60,710	7,096	117	37	0.61
21-24	48,770	3,837	79	24	0.49
25-29	61,653	3,170	51	31	0.50
30-39	108,394	5,080	47	51	0.47
40-49	140,895	5,565	39	49	0.35
50-59	137,970	4,513	33	50	0.36
60-69	84,261	2,322	28	35	0.42
70+	72,859	2,105	29	24	0.33

Source: TIS – Montana Department of Transportation
Motor Vehicle Division – Department of Justice

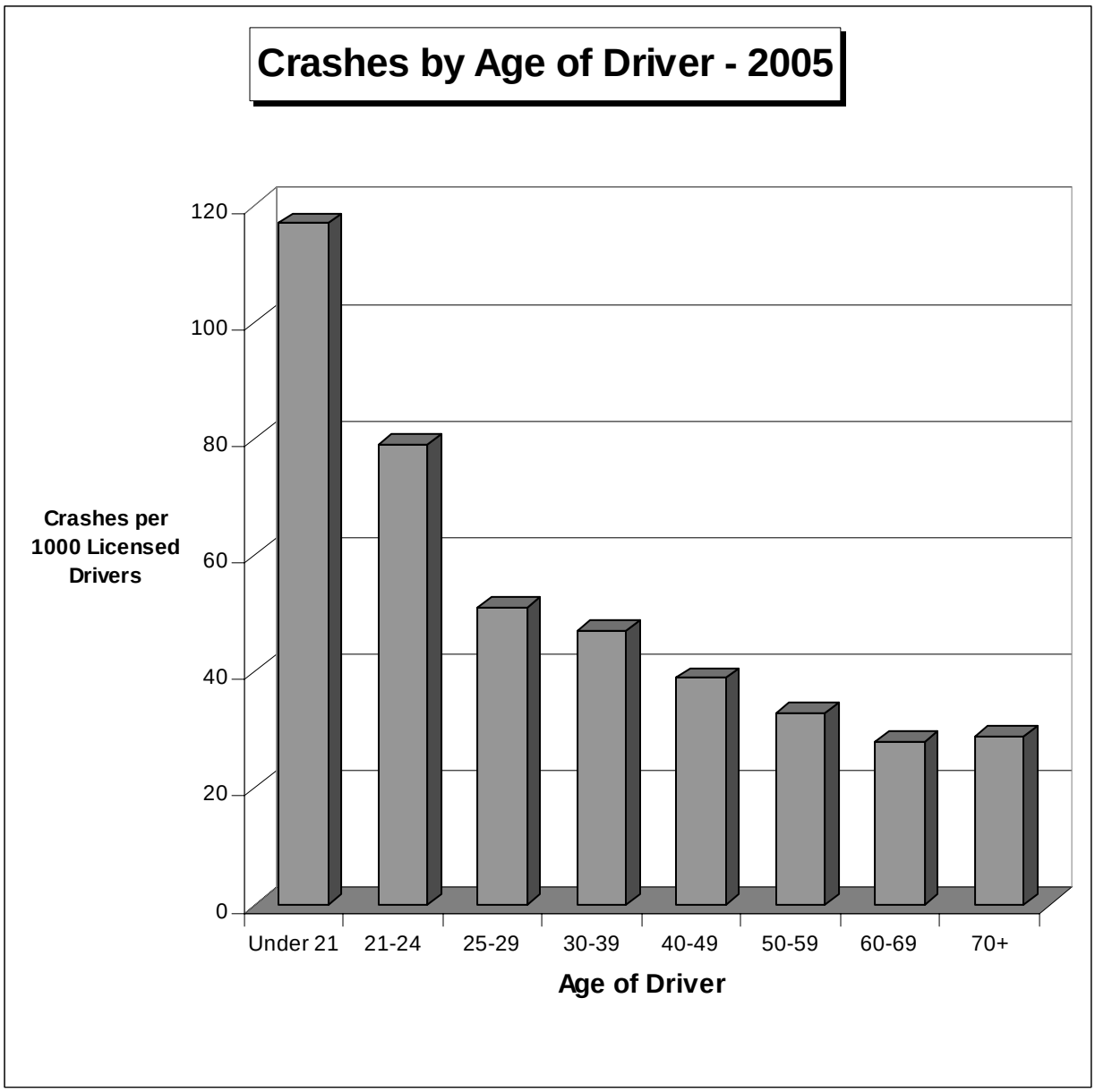
Young drivers are over-represented in traffic crashes based upon the number of licensed drivers. Nationally the number of miles driven by teens is less than for drivers of all ages. In fact teens drive approximately 35% fewer miles than average adults. If teen drivers in Montana are similar to the teens across America, then their rate of crashes per vehicle miles driven would be even more extreme than the rate per licensed driver shown above. Drivers between 15 and 20 years of age were involved in 117 crashes per thousand drivers during 2005. Every other age group over 20 years of age

had a rate of 79 or less crashes per thousand licensed drivers. Each higher age group had fewer crashes per licensed driver than the previous age group, with the exception of the “70 year and over” age group. The data suggests that inexperience and/or risk-taking are factors in crash risk for youth. Certainly the change for each year of age between 15 and 20 supports the supposition that experience is a strong factor. It is of interest to note that a 15 year-old driver is six times more likely to be in a crash than a driver in their sixties.

Similarly, the fatal crash rate is somewhat lower for older drivers. Drivers under 21 were involved in 0.61 fatalities per thousand licensed drivers. During the last two years this rate has been significantly lower than the rate of 0.91 during 2003. All age groups above 25 were involved at a rate of 0.50 or less fatalities per thousand drivers.

The following chart shown in Figure 18 shows the change in crash incidence by age of driver.

Figure 18


Crashes by Age of Driver - 2005
Crashes per 1000 Licensed Drivers
120
100
80
60
40
20
0
Under 21
21-24
25-29
30-39
40-49
50-59
60-69
70+
Age of Driver

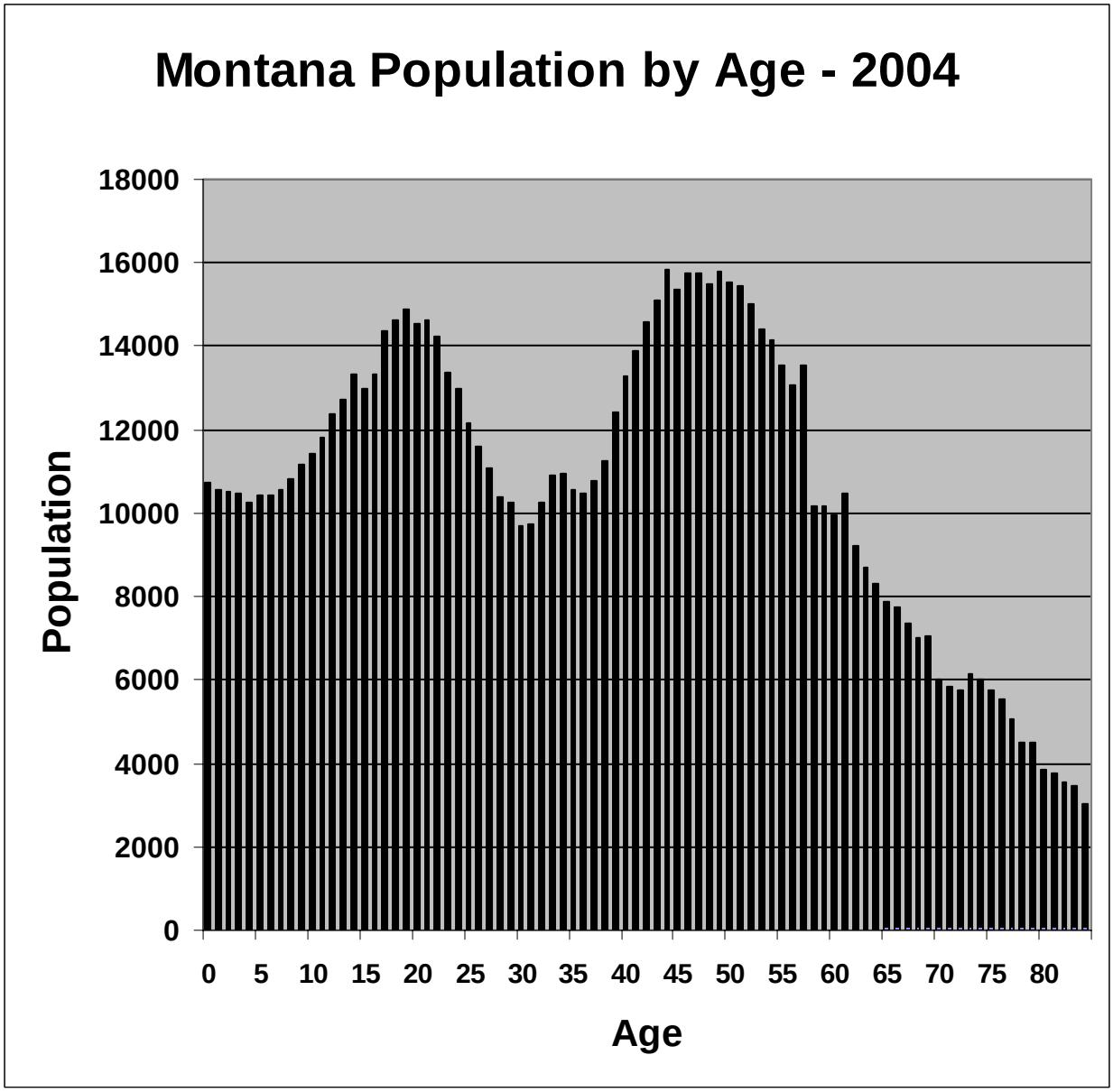
In order to envision the challenges before Montana's citizens in the traffic safety area, the population by age estimate for 2004 is next presented on the following page. During 2004, the baby boom population in Montana seemed to span the age group from 41-57. There is a second boom in Montana from age 12-25. The variation in population for some ages is quite significant. It should be noted that there are more than 14,000 Montana citizens for each of the ages eighteen to twenty-three and forty-two to fifty-four; but there are less than 10,000 for each of the ages thirty and thirty-one.

What does this mean to traffic safety? Over the next fifteen years there will be steady growth in the number of drivers over 60 years of age. This will become a significant concern of the traffic safety community as the number of older drivers increases. Currently, and over the next few years, Montana will have an above average number of teen and young adult drivers. This is the highest risk group in traffic safety. So the number of elderly drivers and the number of drivers under 30 is increasing while the group of drivers between 30 and 55 will be decreasing.

Some of the gains made in Traffic Safety during the 1980's were related to demographics rather than actual gains. They were achieved in part because the drivers most likely to be in fatal crashes are between 15 and 30. There were less of these drivers during this decade. For the opposite reason, we have made minimal gains over the last ten years. There are now more drivers in this age group.

These population figures are being noted because of the special challenges that they present to traffic safety. It will be doubly difficult in the near future to show improvement in traffic safety while the number of drivers in the high-risk age groups increases. Some rate improvements may be realized in traffic safety, but it will be much more difficult to decrease the number of incidents relating to these age groups.

Figure 19


Montana Population by Age - 2004
Population
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80
Age

7. Motorcycle Involvement in Crashes

Motorcyclists in traffic crashes comprise a relatively small percentage of all persons involved in crashes. However, these persons are at much greater risk. Because of this, people who ride motorcycles account for a significant amount of Montana's fatalities and serious injuries. Table 38 examines the number of motorcycle registrations, crashes, fatal crashes and injury crashes over the past ten years.

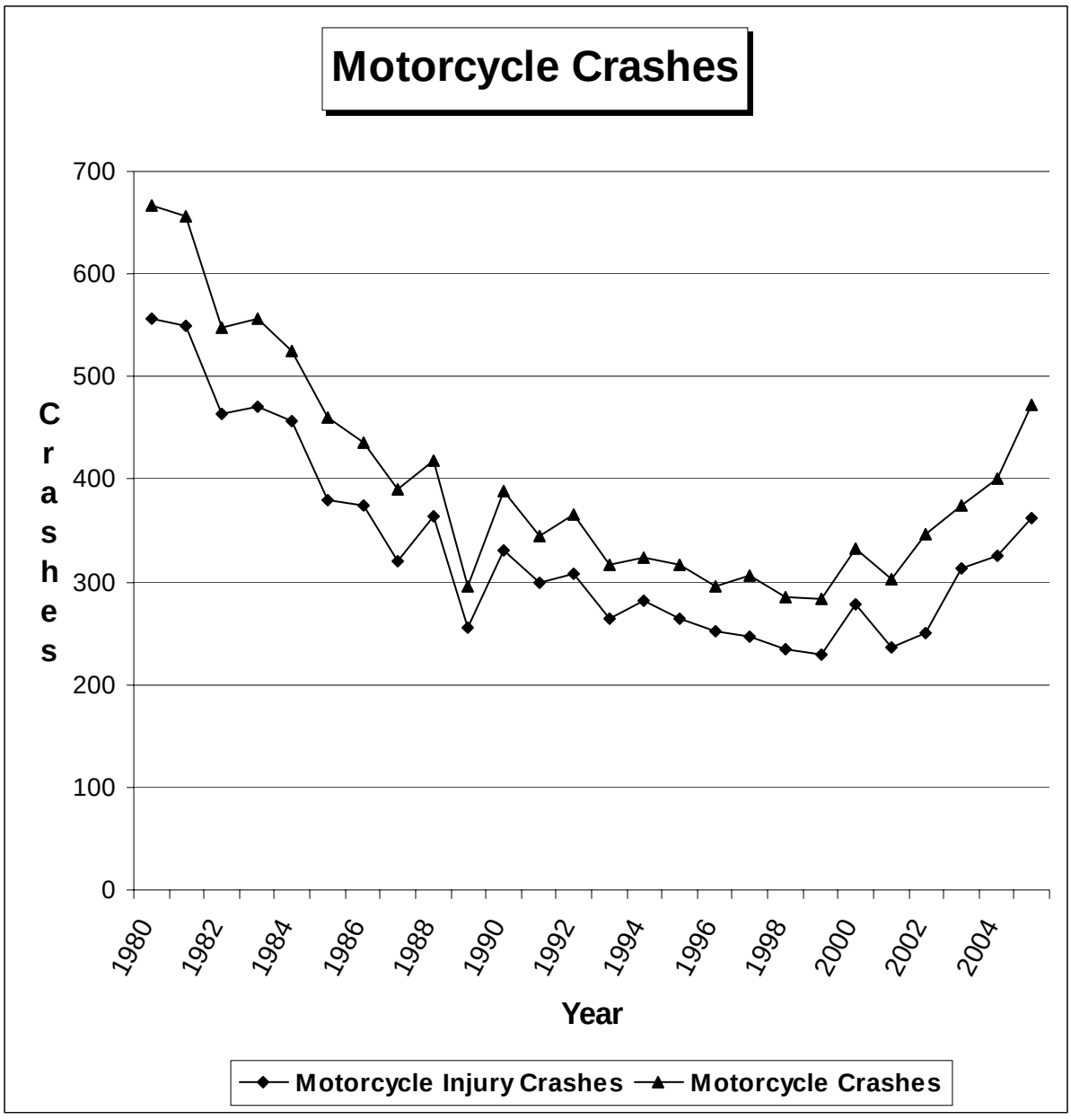
Table 38
Motorcycle Crashes

Year	Motorcycle Regist-rations	Crashes	Percent of All Crashes	Fatal Crashes	Percent of all Fatal Crashes	Injury Crashes	Percent of all Injury Crashes
1996	17,935	296	1.2%	8	4.5%	252	3.6%
1997	17,978	307	1.4%	18	8.1%	246	3.5%
1998	NA	286	1.3%	13	6.3%	235	3.5%
1999	NA	284	1.3%	15	7.7%	229	3.4%
2000	NA	332	1.5%	14	7.0%	279	4.0%
2001	25,618	302	1.4%	11	5.5%	236	3.8%
2002	28,111	347	1.5%	24	10.3%	251	3.9%
2003	34,433	375	1.6%	12	4.6%	314	5.0%
2004	42,967	400	1.8%	20	9.6%	325	5.4%
2005	64,841	473	2.1%	28	12.5%	362	6.0%
Chg 1 Year	50.9%	+18.3%	+16.7%	+40.0%	+30.2%	+11.4%	+11.1%
Chg 5 Year	---	+34.7%	+34.6%	+72.3%	+68.9%	+28.8%	+35.7%

Source: TIS – Montana Department of Transportation

It would be easy to say that there is an increased danger of motorcycle crashes during the last five years. This is probably not true! Motorcycle registrations have been increasing significantly over the last few years and are more than triple the number occurring in 1997, while injury crashes have increased less---47% during that same period. Although, the numbers of crashes, injuries and fatalities are all increasing, the rates of crashes per registered vehicle are actually down. The vehicle miles traveled by motorcycles are unknown. This data would yield a more valid crash rate if it existed. Figure 20 on the following page shows the trend in motorcycle crashes and injuries.

Figure 20


Motorcycle Crashes
700
600
500
400
300
200
100
0
Crashes
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
Year
Motorcycle Injury Crashes
Motorcycle Crashes

Helmet usage for drivers and passengers in motorcycle crashes is displayed in the following table. Usage was quite low for most ages, but increased significantly over 2004 levels. For most age groups in crashes, usage was between 40 and 50 percent.

Table 39
Motorcycle Helmet Use by Age
(2005 Crash Data)

Age	Driver		Passenger	
	Used	Not Used	Used	Not Used
14 & Under	3	4	4	2
15-17	8	6	3	2
18-19	13	15	1	2
20-24	31	33	2	4
25-34	36	40	3	7
35-64	108	158	17	19
65 & Over	5	8	0	0
Not Stated	0	5	0	0
Total	204	269	30	36

Source: TIS - Montana Department of Transportation

The observational helmet use survey estimates a 65 percent usage rate for 2006. Usage on interstate routes was relatively high at 82%. Primary route usage was 60%, while city usage was lower at 52%. Secondary and county roads had 66% on only 32 observations. The overall statewide usage rate is derived from only 283 observations making the precision of the estimate less than desirable. This small sample size means that there is 95 percent confidence that the estimate is within 6 percentage points of the actual usage.

Of the motorcyclists who are in traffic crashes, 37.1% receive a fatal or severe injury. In crashes of all vehicle types only 3.7% of the occupants receive this level of injury. The chance of severe injury is about ten times higher when riding motorcycles. Motorcyclist deaths continue to be a concern in the state. Severe injuries have a large impact because of the medical costs and continuing care costs to the public and private sectors.

Differences between drivers from crashes involving a motorcycle and drivers from all crashes were investigated. There were several different fields where motorcyclist

exhibited worse characteristics than the general driver. These are shown in Table 40 below.

Table 40
Comparison of Motorcycle Drivers and All Drivers
(2005 Crash Data)

Driver Status	MC Drivers	All Drivers
Driver's by Sobriety – Alcohol or Drugs Present	10.9%	6.0%
Driver did not comply with restrictions	9.0%	1.6%
No License, Suspended, Canceled, Expired or Revoked	6.1%	3.7%

Source: TIS - Montana Department of Transportation

In the next table, we examine the age of motorcycle fatal crash victims. Most fatalities in past decades occurred in the 20-34 year age group. However, in recent years there has been a shift occurring with most fatalities coming from over 35 years of age. A few fatalities are even occurring in the 65 and over age group, which prior to 1995 was a rarity.

Table 41
Motorcycle Fatalities by Age

Year	Age Groups							
	0-14	15-17	18-19	20-24	25-34	35-64	65+	Total
1996	0	0	2	2	1	4	0	9
1997	0	1	2	2	4	11	0	20
1998	0	0	1	0	3	8	2	14
1999	0	0	0	2	3	10	0	15
2000	0	0	0	3	1	8	1	13
2001	0	0	0	2	2	6	2	12
2002	0	1	0	3	3	14	3	24
2003	0	0	0	1	2	7	2	12
2004	0	2	0	2	1	10	5	20
2005	0	0	0	3	5	18	2	28
10 Yr Total	0	4	5	20	25	96	17	167

Source: TIS – Montana Department of Transportation

8. Collisions with Pedestrians

A general summary of pedestrian collisions is displayed below in Table 42. Pedestrian crashes account for 4.8% of all fatal crashes, but less than one percent of all crashes.

Table 42
Motor Vehicle Collisions with Pedestrians

Year	Crashes	% of All Crashes	Fatal Crashes	% of all Fatal Crashes	Fatalities	Injury Crashes	Injuries
1996	180	0.7%	13	7.3%	13	149	178
1997	167	0.7%	9	4.0%	9	136	146
1998	166	0.8%	13	6.3%	13	135	148
1999	153	0.7%	7	3.1%	7	128	139
2000	161	0.7%	11	5.5%	11	139	148
2001	167	0.8%	9	4.5%	9	141	163
2002	174	0.7%	14	6.0%	14	152	164
2003	163	0.7%	10	4.2%	10	138	158
2004	156	0.7%	10	4.8%	10	114	124
2005	148	0.7%	14	6.3%	14	131	141
Chg 1 Year	-5.1%	---	+40.0%	+31.2%	+40.0%	+14.9%	+13.7%
Chg 5 Year	-9.9%	-2.8%	+29.6%	+26.0%	+29.6%	-4.2%	-6.9%

Source: TIS – Montana Department of Transportation

Pedestrian crashes, which occur outside of city limits, are less common than urban crashes. However, rural crashes tend to have a higher percentage of fatal and severe injury crashes. During the last ten years, less than 23% of pedestrian crashes were rural. At the same time, more than 46% of the fatal crashes were rural. About five fatalities and forty injuries occur during an average year on rural roads.

Table 43 lists the pedestrian injuries plus fatalities by age. Injuries from pedestrians makes up a small percentage of total injuries in the state, but the number of pedestrian fatalities still makes up a significant amount of the total number of fatalities. Injuries seem to be on the increase for pedestrians from 35 to 64 years of age.

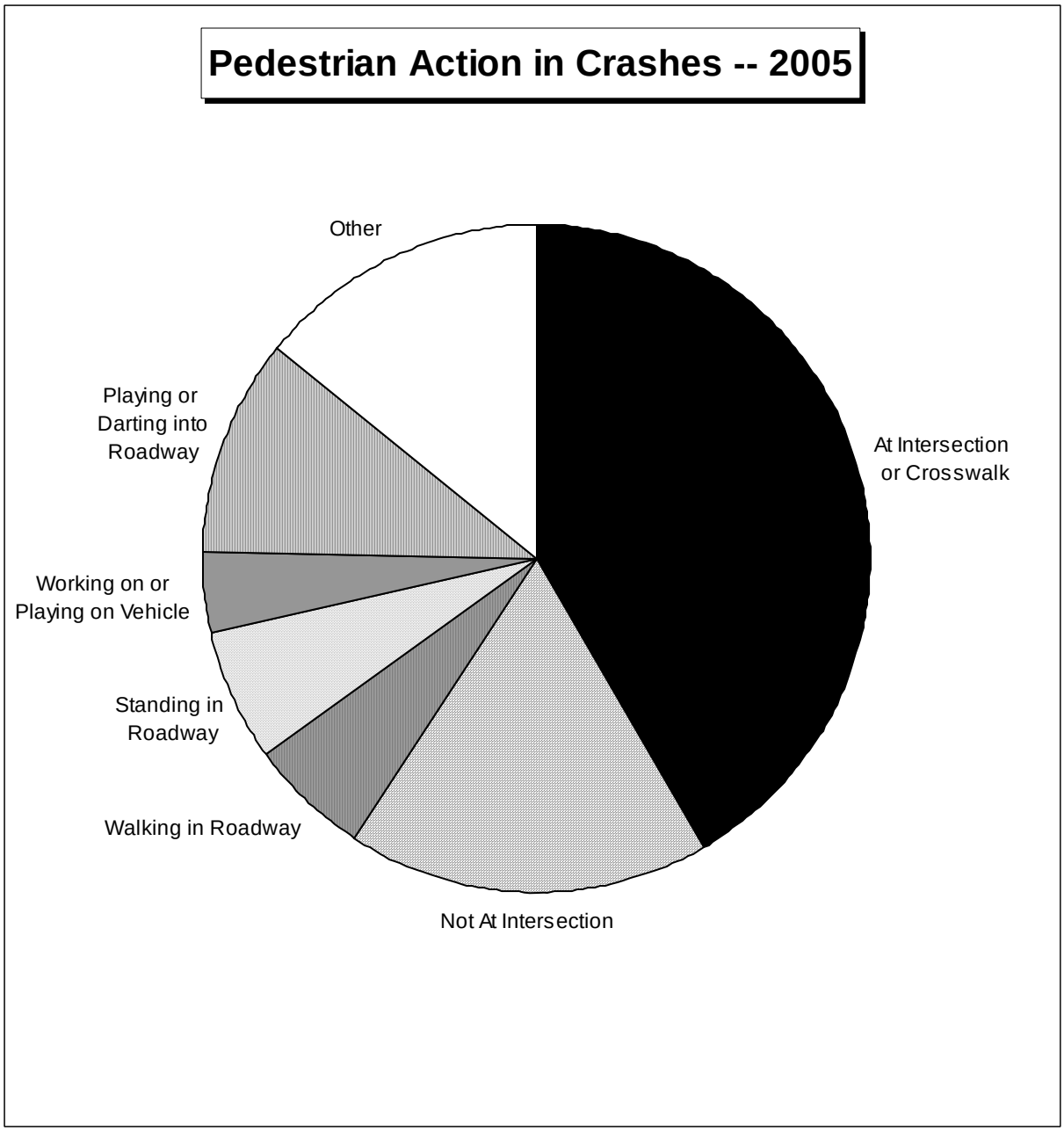
Table 43
Pedestrian Fatalities and Injuries by Age – 2005

0-4	5-14	15-24	25-34	35-44	45-54	55-64	65+	Total
3	17	37	17	23	22	23	13	155

Source: TIS – Montana Department of Transportation

Figure 21 on the following page shows a pie chart for all pedestrian collisions by pedestrian action during 2005.

Figure 21


Pedestrian Action in Crashes -- 2005
Other
Playing or Darting into Roadway
At Intersection or Crosswalk
Working on or Playing on Vehicle
Standing in Roadway
Walking in Roadway
Not At Intersection

9. Collisions with Bicyclists

Bicycle crashes with motor vehicles, was lower than any time since 1993. For five straight years the number of crashes involving bicycles has decreased. Four bicycle related fatalities occurred during 2005, the most since 2000. The summary data is presented in Table 44.

Table 44
Motor Vehicle Collisions with Bicyclists

Year	Crashes	Percent of All Crashes	Fatalities	Percent of all Fatalities	Injuries
1996	180	0.74%	2	1.13%	158
1997	224	0.99%	1	0.38%	202
1998	198	0.90%	1	0.42%	183
1999	178	0.84%	3	1.36%	183
2000	200	0.90%	8	3.40%	177
2001	177	0.81%	0	0.00%	163
2002	172	0.73%	1	0.37%	158
2003	170	0.73%	2	0.76%	153
2004	167	0.77%	2	0.87%	149
2005	157	0.70%	4	1.59%	137
Chg 1 Year	-6.0%	-9.1%	+100%	+82.8%	-8.1%
Chg 5 Year	-11.4%	-11.2%	+53.8%	+47.2%	-14.4%

Source: TIS – Montana Department of Transportation

Table 45 presents bicyclist casualties (fatalities + injuries) by age. The injuries during 2005 were less than any recent year. The 10-14 year old age group remains the highest risk group. In recent years, the age group from zero to nine has decreased in number of injuries, while the age groups ranging from 35 to 54 have increased in casualties.

Table 45
Bicyclist Casualties by Age – 2005

0-9	10-14	15-19	20-24	25-34	35-44	45-54	55+	Total
16	25	17	22	22	20	16	3	141

Source: TIS – Montana Department of Transportation

10. Truck Involvement In Crashes

This section examines Montana crashes involving trucks. The table that follows contains a ten-year history of truck-involved crashes within the state. This analysis is not for commercial trucks only, but for all trucks. The database containing commercial vehicle crash data within Motor Carrier Services will not coincide with the data shown below.

The number of truck crashes reached a high in 1996 and has decreased by nearly 30% over the eight years since then. The number of fatal crashes involving trucks was up from 2004.

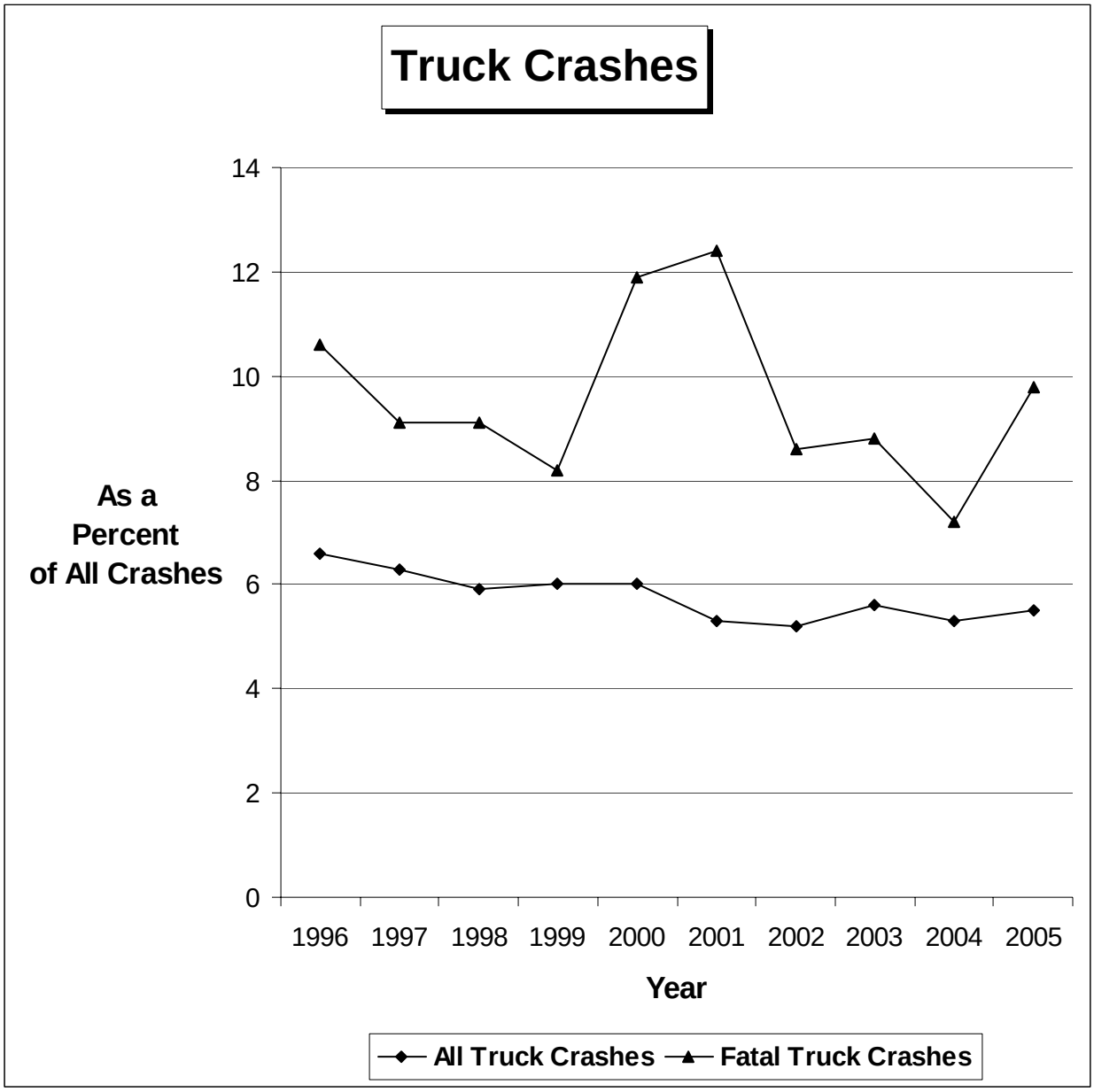
Table 46
Number of Crashes Involving Trucks

Year	Crashes		Fatal Crashes	
	Number	Percent of all Crashes	Number	Percent of all Fatal Crashes
1996	1646	6.6%	21	10.6%
1997	1426	6.3%	24	9.1%
1998	1310	5.9%	19	9.1%
1999	1262	6.0%	16	8.2%
2000	1346	6.0%	24	11.9%
2001	1159	5.3%	25	12.4%
2002	1228	5.2%	20	8.6%
2003	1288	5.6%	21	8.8%
2004	1163	5.3%	15	7.2%
2005	1241	5.5%	22	9.8%
Chg 1 Year	+6.7%	+3.8%	+46.7%	+36.1%
Chg 5 Year	+0.3%	+0.4%	+4.8%	+0.2%

Source: TIS - Montana Department of Transportation

Figure 22 on the following page shows the number of truck crashes as a percentage of all motor vehicle crashes and fatal truck crashes as a percentage of all motor vehicle fatal crashes.

Figure 22


Truck Crashes
As a Percent of All Crashes
14
12
10
8
6
4
2
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year
All Truck Crashes
Fatal Truck Crashes

This table presents the type of trailer for trucks. All configuration types had a high number of crashes during 1996, which were likely caused by abnormally icy roads. These counts include trucks and truck/tractor combinations. They also include trucks, which are towing other types of trailers, which could include boat trailers, house trailers and utility trailers.

Table 47
Truck Crashes by Trailer Type

	Crashes				Fatal Crashes			
Year	No Trailer*	Single Trailer	Double Trailer	Triple Trailer	No Trailer	Single Trailer	Double Trailer	Triple Trailer
1996	467	1014	163	2	7	13	1	0
1997	424	893	106	3	3	18	3	0
1998	393	785	131	1	5	12	2	0
1999	336	800	125	1	5	8	3	0
2000	328	905	111	2	5	19	0	0
2001	335	722	102	0	2	20	3	0
2002	340	801	84	3	6	12	2	0
2003	470	712	100	6	8	13	2	0
2004	461	634	103	2	6	9	1	0
2005	509	701	92	1	8	13	2	0
Chg 1 Yr	+10.4%	+10.6%	-10.7%	-50.0%	+33.3%	+44.4%	+100%	---
Chg 5 Yr	+31.6%	-7.1%	-8.0%	-61.5%	+48.1%	-11.0%	+25.0%	---

Source: TIS – Montana Department of Transportation

* Trucks with no trailer would include single unit vehicles. They could also include Tractor-Trucks that currently are not pulling a trailer.

11. Other Issues and Information

a. Buses and Unusual Vehicle Involvement in Crashes

This section displays data for unusual vehicles such as buses, ambulances, farm machinery and fire trucks. Table 48 contains data on the number of these unusual vehicles involved in crashes for a ten-year period.

Table 48
Unusual Vehicle Types in Crashes

Year	School Bus	Bus	Ambulance	Farm Machinery	Fire Truck	Snow-mobile
1996	71	91	11	33	11	15
1997	73	71	14	32	12	14
1998	48	58	11	32	15	13
1999	63	60	9	16	8	12
2000	59	67	10	23	11	5
2001	65	69	8	15	12	6
2002	83	76	13	16	5	4
2003	66	63	11	18	10	3
2004	65	65	13	18	7	1
2005	80	71	3	11	7	5
Chg 1 Yr	+23.1%	+9.2%	-76.9%	-38.9%	---	+400%
Chg 5 Yr	+18.3%	+4.4%	-72.7%	-38.9%	-22.2%	+31.6%

Source: TIS – Montana Department of Transportation

Ambulance, Farm Machinery and Fire Truck crash numbers were all well below the five-year average. Snowmobiles certainly seem to be trending much lower than earlier years.

b. Collisions with Animals or Avoidance

During the twenty-year period from 1984 to 2003, the number of reported crashes involving wild animals increased from 468 to 2,012. This number has been somewhat lower during the last two years as shown in Table 49. The key word in the first sentence is 'reported', since many animal crashes are not reported. The long-term trend is shown on the following page in Figure 23. The number of crashes involving domestic animals has shown no trend over the years.

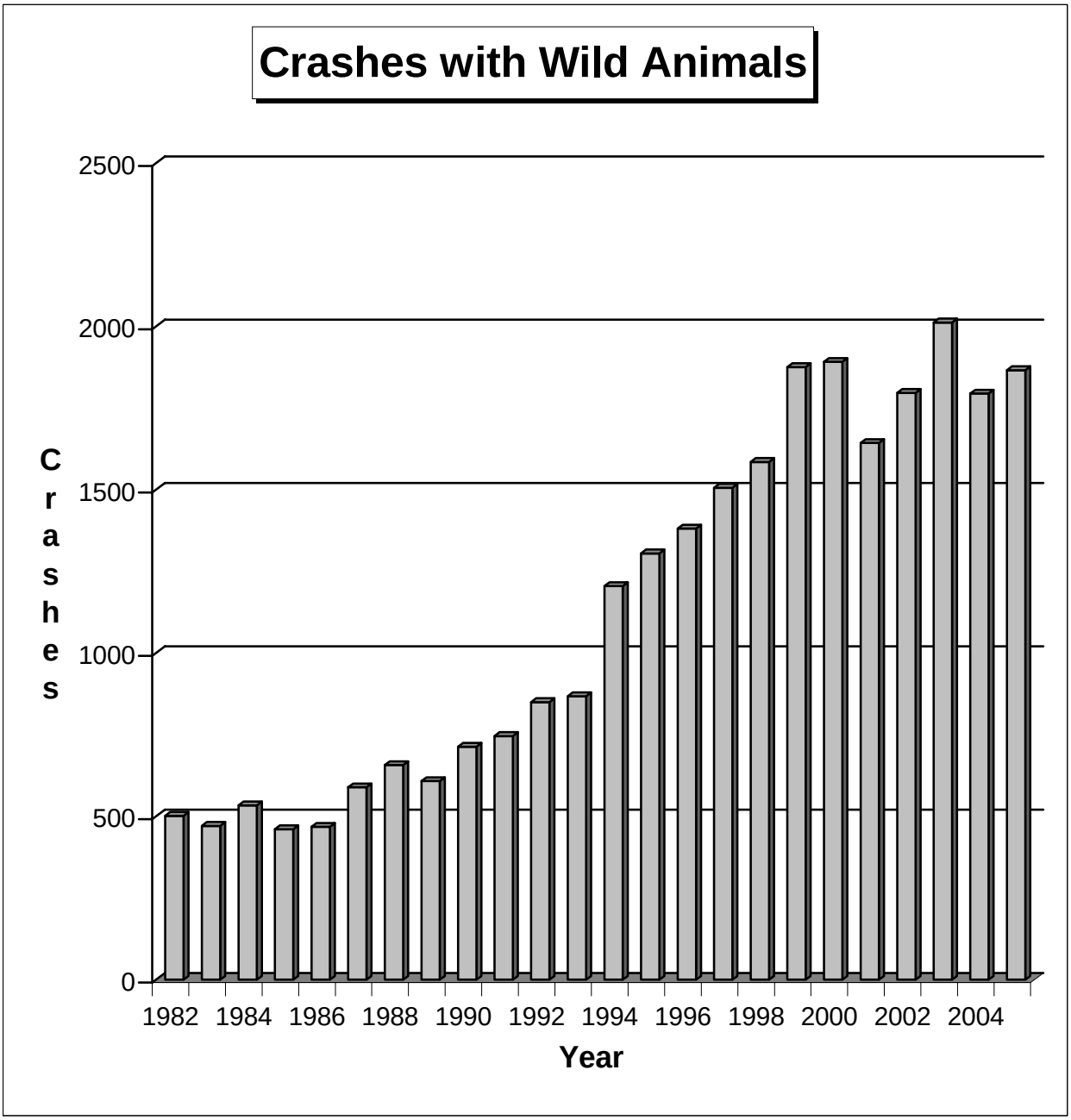
Table 49
Crashes Involving Animals

Year	Crashes With Wild Animals	Fatal Crashes With Wild Animals	Crashes With Domestic Animals	Fatal Crashes With Domestic Animals
1996	1,381	2	250	0
1997	1,506	3	241	3
1998	1,585	0	262	2
1999	1,875	0	298	2
2000	1,891	1	237	1
2001	1,643	3	201	1
2002	1,796	3	239	3
2003	2,012	3	234	1
2004	1,794	2	233	4
2005	1,866	5	194	2
Chg 1 Year	+4.0%	+150%	-17.7%	-50.0%
Chg 5 Year	+2.1%	+108%	-15.2%	---

Source: TIS – Montana Department of Transportation

The Department of Transportation keeps a database, which accounts for wild animals that are picked up off the roadways by the Maintenance Division. The assumption that these carcasses were the result of collision with motor vehicles would seem valid. This count of carcasses provides another estimate of the number of wild animal crashes. These numbers are from three to four times higher than reported crashes.

Figure 23


Crashes with Wild Animals
2500
2000
1500
1000
500
0
Crashes
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
Year

c. Railroad Crossing Safety

Motor vehicle collisions with trains are a relatively rare event, but the severity of such collisions is often very high. Table 50 presents a history of these collisions on public roadways in Montana for rural roads and for all roadways. Crashes in rural areas may be declining.

Table 50
Collisions with Trains

Year	Rural			Total		
	Crashes	Fatal Crashes	Injury Crashes	Crashes	Fatal Crashes	Injury Crashes
1996	24	3	10	27	3	11
1997	20	0	11	28	0	16
1998	16	2	6	24	2	11
1999	11	1	4	12	1	4
2000	19	1	6	22	1	6
2001	7	0	2	9	0	2
2002	9	1	3	20	2	6
2003	2	0	0	19	3	3
2004	10	0	4	15	0	5
2005	9	1	4	14	1	4
Chg 1 Yr	-10.0%	---	---	-6.7%	---	-20.0%
Chg 5 Yr	-4.3%	+150%	+33.3%	-17.6%	-16.7%	-9.1%

Source: TIS – Montana Department of Transportation

E. COUNTY RANKING

The following section places a ranking on the 56 counties in Montana. This ranking is one of several factors used to determine funding level for safety programs. The first three categories are indices of traffic safety problems, while the last one indicates level of local enforcement in seat belt convictions.

Table 51

County Ranking for Traffic Safety

Rank	County	Severe Crash Rank	Alcohol Cr+inj+ Frank	Ped+Bike +Mcycle Rank	Restraint Conv Rank	Sum of Ranks
1	Missoula	1	2	2	1	6
2	Yellowstone	3	1	1	5	10
2	Flathead	2	3	3	2	10
4	Cascade	6	4	4	4	18
5	Gallatin	4	5	5	7	21
5	Lewis and Clark	6	6	6	3	21
7	Ravalli	5	8	7	9	29
8	Lake	8	7	8	17	40
9	Silver Bow	10	14	10	6	40
10	Lincoln	9	9	10	17	45
11	Carbon	15	15	10	11	51
12	Sanders	11	17	10	20	58
13	Park	19	12	9	22	62
14	Beaverhead	14	18	19	14	65
15	Glacier	18	11	17	24	70
16	Jefferson	13	21	10	27	71
17	Hill	31	13	21	8	73
17	Madison	17	19	10	27	73
19	Custer	25	23	18	12	78
20	Richland	25	22	24	10	81
21	Big Horn	12	16	23	35	86
22	Mineral	15	20	10	42	87
23	Dawson	35	25	21	13	94
24	Broadwater	28	34	28	15	105
24	Stillwater	19	30	24	32	105
26	Roosevelt	23	10	31	42	106
27	Powell	22	32	19	35	108
28	Rosebud	25	29	28	27	109
29	Fergus	24	24	24	42	114

Rank	County	Severe Crash Rank	Alcohol Cr+Inj+ F Rank	Ped+Bike +Mcycle Rank	Restraint Conviction Rank	Sum of Ranks
30	Valley	42	26	31	17	116
31	Deer Lodge	28	37	24	35	124
31	Blaine	33	26	38	27	124
33	Musselshell	34	40	31	20	125
34	Pondera	42	30	38	16	126
35	Toole	37	28	31	32	128
36	Sweet Grass	28	36	38	27	129
37	Teton	38	33	38	24	133
38	Granite	21	41	30	42	134
39	Phillips	35	35	31	42	143
40	Powder River	47	43	31	32	153
41	Wibaux	38	37	46	42	163
42	Wheatland	42	43	38	42	165
43	Chouteau	31	47	46	42	166
44	Sheridan	42	37	46	42	167
45	McCone	51	45	38	35	169
46	Meagher	42	48	38	42	170
46	Fallon	47	53	46	24	170
48	Treasure	38	53	38	42	171
49	Petroleum	47	48	46	35	176
49	Daniels	55	53	46	22	176
51	Prairie	55	42	46	35	178
51	Judith Basin	38	52	46	42	178
53	Garfield	51	48	46	35	180
53	Carter	51	56	31	42	180
53	Golden Valley	47	45	46	42	180
56	Liberty	51	48	46	42	187

Source: TIS – Montana Department of Transportation

The four rankings are summed and then those totals are ordered. This table can be used as a very general ordering for traffic safety problems and solutions by county.

Some counties or cities within counties will have special safety problems that are not represented by the above table and these instances will be taken into account if necessary. Many counties and cities will not have sufficient resources to manage an attack on their safety problems. Sometimes, several counties or cities may work together on certain issues.

Cost benefit is a factor when funding counties. If a large benefit can be gained with a small amount of money, this could override a project in a higher priority county. There

is a limited amount of funding and sometimes this funding is earmarked to certain areas. This and other factors may also override priorities.

Conclusion

The Problem Identification for FY 2007 explores many traffic safety issues in Montana. It is a compilation, which contains a large amount of varied data. There is much statistical "noise" in the various data, since there are so many variables that affect crashes including driver behavior, vehicles, roads, weather, laws and even something as simple as a change to a reporting form. It is difficult to reach significance because of these many factors along with the relatively small number of crashes and fatal crashes in the state.

This paper should be used as a guide when looking at the traffic safety problem or when attempting to find solutions for Montana traffic safety. Often it is safer to look at long-term trends, rather than a one-year increase or decrease which may have occurred from something as simple as an unusual winter. Perhaps a particular traffic safety intervention had no impact at all, but some other variable created the perceived result. Care should always be given that you don't make assumptions for the cause of certain situations without looking at all possibilities. When in doubt one should error on the side of caution.

Questions or comments on this study should be directed to the State Highway Traffic Safety Office at the Montana Department of Transportation. For additional information call the office at (406) 444-3298.